# MUXDVR
# User Manual

**VER 2.2**

**00-37963-DCEB2**

# Precautions

- All the safety and operation instructions should be read before the MUXDVR is operated.
- All the safety and operation instructions should be retained for future reference.
- Comply with operating instruction and notice warning information.
- Do not use strong or abrasive detergents when cleaning the MUXDVR.
- There are no user-serviceable parts inside. Contact qualified service personnel for maintenance.
- Do not expose the MUXDVR to water or moisture and do not try to operate it in wet areas. Well-chosen cover is needed when you put the MUXDVR in outdoor areas.
- Make sure that two ends of the power port are plugged.
- Do not drop metallic parts through slots or slop the MUXDVR with any liquid.
- Do not attempt to disassemble the MUXDVR.
- Contact qualified service personnel if the following situation happens:
    - The power-supply cord or plug is damaged.
    - The MUXDVR has been exposed to rain or water.
    - The MUXDVR does not operate normally by following the operating instructions.
    - The MUXDVR falls to the ground or its cover is damaged.
- When replacement parts are required, make sure that the service technician has used replacement parts specified by original seller or that these parts have the same characteristics as the original ones. Unauthorized substitutions may result in fire, electric shock, or other hazards.
- Use only with a mounting accessory recommended by original seller.
- Never push objects of any kind into this MUXDVR through openings as they may touch dangerous voltage points or short cut parts that could result in a fire or electric shock.
- Certify operating safety by qualified installer.
- If an outside cable system is connected to the MUXDVR, be sure the cable system is grounded so as to provide some protection against voltage surges and built-in static charges.
- All normal precautions to avoid component damage due to electrostatic discharge should be taken during installation and operation.
- To prevent electric shock, do not remove screws or covers.

# CONTENT


1. Features ..... 4
2. MUXDVR Application ..... 4
3. Quick Installation Guide ..... 5
4. Front Panel Introduction ..... 6
    4.1 The Buttons on the Front Panel ..... 6
    4.2 HDD and CD-RW ..... 9
5. MUXDVR Menu Tree ..... 10
6. OSD Menu Setup ..... 13
    6.1 Event List ..... 13
    6.2 OSD/ Timer ..... 13
        6.2.1 Date/ Time ..... 13
        6.2.2 Date Display Mode ..... 13
        6.2.3 Date/ Time Display ..... 13
        6.2.4 Date/ Time Position ..... 14
        6.2.5 PB Date/ Time Position ..... 14
        6.2.6 RS-485 Time Calibration ..... 14
        6.2.7 Call Monitor Dwell ..... 14
        6.2.8 Text Color ..... 14
        6.2.9 Display Type ..... 14
        6.2.10 OSD ..... 14
    6.3.Monitor ..... 14
        6.3.1 Video Setup ..... 14
        6.3.2 Live Refresch Rate ..... 14
        6.3.3 Screen Center Point ..... 15
        6.3.4 Background Color ..... 15
        6.3.5 Show Color Bar ..... 15
    6.4 Camera ..... 15
        6.4.1 Configuration Table 1 ..... 15
        6.4.2 Camera Detect ..... 19
        6.4.3 Camera Title ..... 19
        6.3.4 Title Position ..... 20
    6.5 Record ..... 20
        6.5.1 Day/ Night ..... 20
        6.5.2 Weekend ..... 21
        6.5.3 REC Event Only ..... 21
        6.3.4 REC Event At ..... 21
        6.3.5 Switch REC While PB ..... 21
        6.5.6 Rec Priority Mode ..... 21
        6.5.7 Circular Record ..... 22

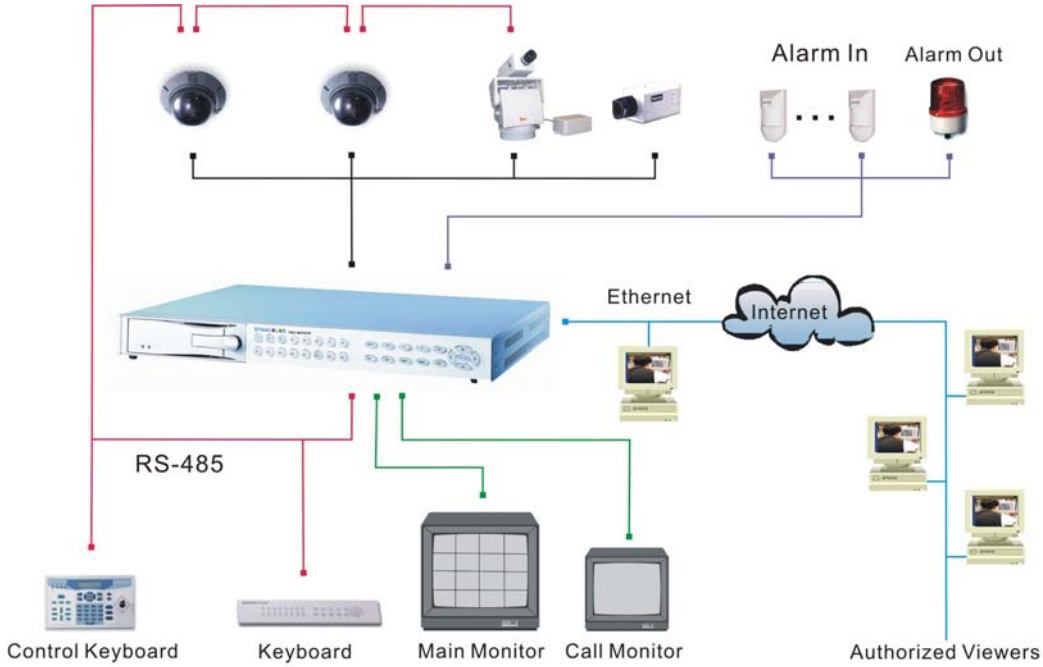
6.5.8 HDD Full Alarm ..... 22
6.6 Event ..... 22
6.6.1 Day/ Night Switch ..... 22
6.6.2 Event Response ..... 23
6.6.3 Motion Detect ..... 24
6.6.4 Alarm In ..... 25
6.6.5 Video Loss Detect ..... 25
6.6.6 Alarm Set/ Reset SW ..... 25
6.6.7 Release Time ..... 25
6.6.8 Clear Event List ..... 25
6.7 Others ..... 26
6.7.1 RS-485 ID Set Up ..... 26
6.7.2 RS-485 Protocol ..... 26
6.7.3 Software Information ..... 26
6.7.4 HDD Information ..... 26
6.7.5 Shutdown ..... 26
6.8 Save/ Load Default ..... 27
6.9 CD-RW Copy ..... 27
6.10 Engineer Set Up ..... 27
6.10.1 Change Password ..... 27
6.10.2 Disable Password ..... 27
6.10.3 Covert Cam Visible ..... 28
6.10.4 Playback Check ..... 28
6.10.5 Super MMX Mode ..... 28
6.10.6 Language ..... 28
6.10.7 Format Hard Disk ..... 29
6.10.8 System Color ..... 29
6.11 Exit ..... 29
7. Windows Application Software ..... 29
7.1 Connect the USB Mobile Rack to PC ..... 29
7.2 Download the Software ..... 30
7.3 Function Buttons ..... 30
8. MUXDVR Remote Access of Video over the Web ..... 32
9. Connectors ..... 36
10. Specification ..... 38
Appendix 1: Hard Disk Error Message ..... 39
Appendix 2: Supported HDD ..... 40
Appendix 3: RS-485 Command Set ..... 41
Appendix 4: Super MMX and Super MPX System Setup ..... 42

# 1. Features

- Powerful Wavelet compression
- Proprietary real time O.S.
- Duplex operation: View live and playback video simultaneously
- Support NTSC and PAL system
- Programmable recording picture rate (up to 60 PPS)
- Recording priority of each camera dynamically adjusted by motion detection
- Hot swappable HDD
- Built in CD-RW for video clip export
- Data format compatible with Windows
- Powerful Alarm Processor allows flexible alarm trigger and response configuration
- Programmable motion detection area and sensitivity for each camera individually
- Different motion sensitivities available for day and night time
- Intelligent algorithm refreshing main monitor display dynamically
- User friendly video search
- Versatile multiple-windows display format
- Password to secure installation authorization
- System auto reboot after power interruption
- System software stored in nonvolatile memory, free from hard disk crash
- P/ T/ Z control available
- Remote monitoring and control through Internet or Ethernet (Optional)

# 2. MUXDVR Application

MUXDVR is a cost-effective and easy-to-use multiplexed digital video recorder, equipped with proprietary real time operating system, powerful Wavelet compression engine, duplex multiplexer front-end, CD-RW and the hot swappable Hard Disc Drive.



# 3. Quick Installation Guide

The MUXDVR is equipped with a mobile rack, the HDD is hot-swappable. You can exchange the HDD when the HDD is full. The following figures illustrate how to install HDD into the removable cartridge.

**Step1:** Pull the active-handle outwards and unlock with the miniature key provided.

**Step2:** Pull the handle outwards till the carrier body is out of the cartridge.

**Step3:** Push the release latch to slide the top cover backwards and remove it.

**Step4:** Insert the DC power cable and IDE cable on the HDD. Make sure the HDD is set to "**Master**".

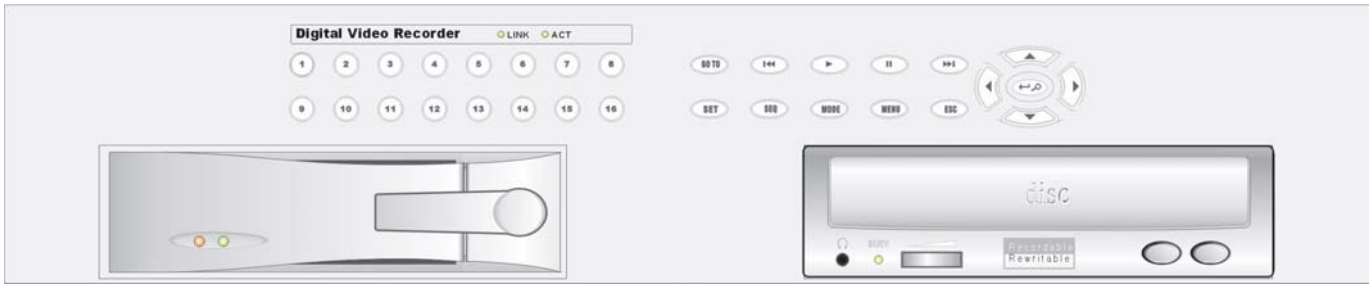
**Step5:** Position the HDD into carrier body and slide the top cover back to secure. Secure the HDD using the screws provided.

**Step6:** Slide the carrier body back in the cartridge frame and lock it with the key provided. Then push the active-handle inwards.

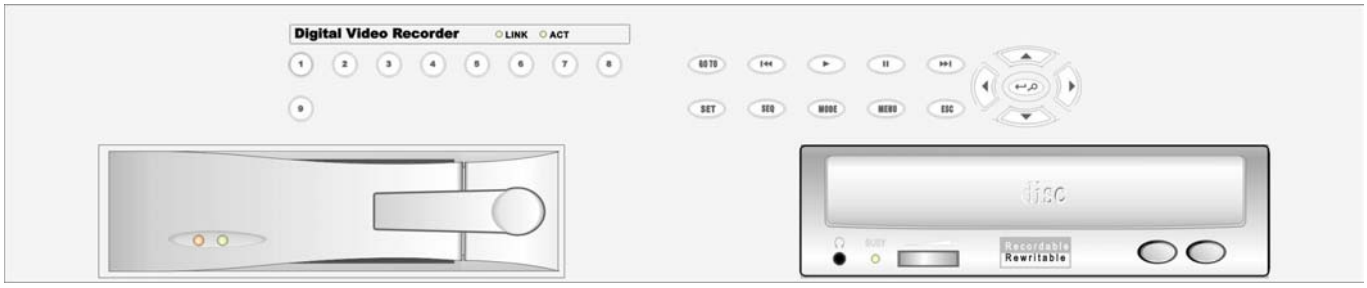
# 4. Front Panel Introduction

The MUXDVR front panel controls enable you to perform preset and programmable functions. The figures below show the available buttons on the front panels.

**16 CH MUXDVR**




**9 CH MUXDVR**

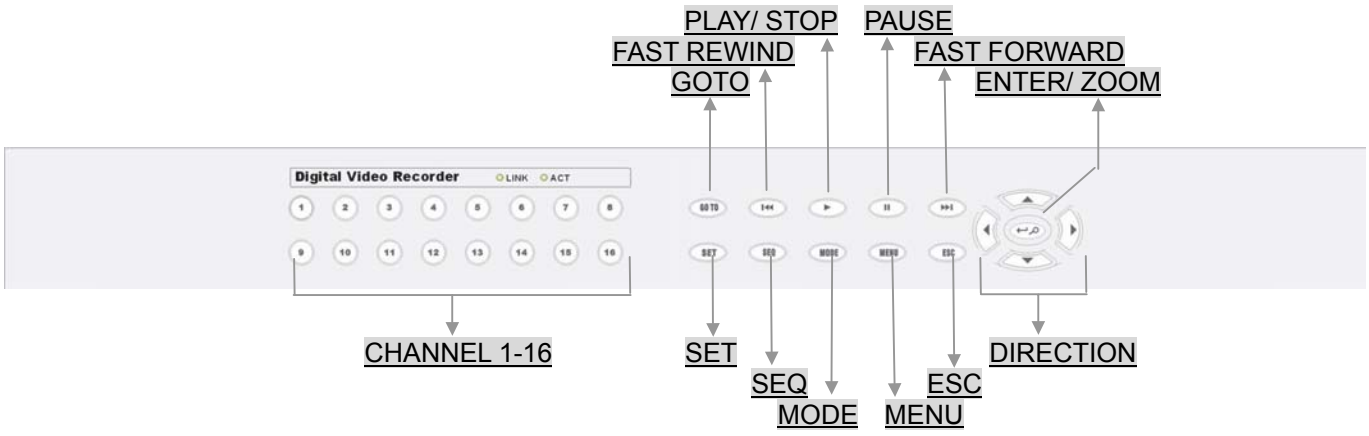



**MUXDVR starts detecting the camera and recording automatically after power is on.

**The 9 channel and 16 chnanel MUXDVR front panels have nine buttons for 9 channels and sixteen buttons for 16 channels, respectively..

## 4.1 The Buttons on the Front Panel

The following are the introductions of MUXDVR front panel buttons. The front panel is illustrated and each button is described by name and function.




### CHANNEL 1~16

1. The number of channel buttons corresponds to the number of channels supported by the unit. Press one of these buttons to view the channel full screen.

2. Press the number button corresponding to the wanted camera, and then press the SET button to go to the “External Devices” Menu; you should go to the “Configuration Table 1” first to set the correspondent dome’s “External” item to enable.

## GOTO

In playback mode, you can press GOTO to enter GOTO menu. This menu allows you to search for certain recorded video by date and time, or you may either go to the beginning or the end of the recorded video.

## FAST REWIND

In playback mode, press this button to play recorded video in reverse direction. Press it repreatedly can change the rewind speed: x1, x2, x4 and x8. If the button has been pressed and held for 3 seconds, the MUXDVR will go to the beginning of the recorded video.

## PLAY

1. In Live mode, press this button to start playing back recorded video.
2. In Playback mode, press this button to stop playing (and the MUXDVR will start recording automatically). When the MUXDVR has played back to the end of the video, it will pause on the very last image ,and you can press ESC to leave the image and start recording again.

## PAUSE

Press this button to pause playback video or to freeze live video. During this time of pause, the pause LED would be lit.

## FAST FORWARD

In playback mode, press this button to play recorded video in forward direction. Press it repreatedly to increase the speed by x1 x2, x4 and x8. If the button has been pressed and held for 3 seconds, the MUXDVR will go to the end of video.

## ENTER / ZOOM

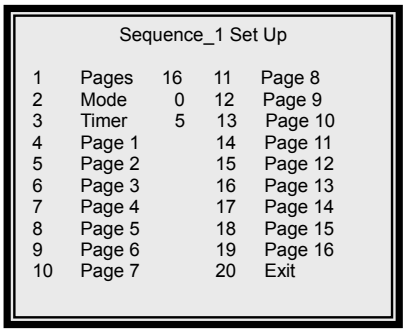
1. In OSD menu mode, this button is used to make the selection or save settings.
2. In full-screened mode, this button functions as a “2x2 Zoom In” button (the LED will be lit).

## SET

In multi-windows display mode, press this button to enter SET mode.

The menu will appear with the cursor over the first window. Use DIRECTION buttons to move the cursor, then press the CHANNEL button to assign the camera directly. The cursor will move to next window automatically. Press ESC button to exit SET mode.

## SEQ




1. In Live mode, press this button to enter automatic sequential sequencing mode, and press it again to exit. The button LED will be lit (and also those channel LEDs currently in display).
2. The MUXDVR allows you to setup the sequence. In Sequence mode, press SET to enter and press MODE to exit this Sequence Setup menu. The number on the top is to remind you which sequence is being set. Other items will be described by following paragraphs.

- **Pages**

  This first item allows you to decide the total number of pages for this sequence. The maximun value is 16, which means that each sequence can have up to 16 pages.

- **Mode**

  This item allows you to decide which display mode will be used in this sequence. “0“ represents “full screen” mode, …and “7” represents 16-windows mode.

- **Timer**

  This item allows you to set each page’s dwell time.

- **Page Setup**

  These items allow you to setup each page. Press Enter for page setup. Use directional buttons to change each page’s channel setting.

## MODE

Press this button to select display formats (4, 5, 7, 9,10,13 and 16 windows). The camera LEDs of selected cameras should be lit.

## MENU

Press this button to enter OSD setup menu (the LED will be lit).

## ESC

1. In OSD mode, press this button to return to previous menu. At the end of playback, the MUXDVR goes to Pause mode; press ESC to return to Record mode.
2. If you press this button and “Down Arrow” simultaneously, the MUXDVR will be shutdowned.

## DIRECTION

1. These buttons function as directional control in Zoom mode or OSD menu.
2. In Zoom mode, press these buttons to view the wanted viewing area.
3. In multi-window mode, the MUXDVR allows you to select one window to playback the recorded video while the MUXDVR is in Live mode. Press one of these buttons and a window cursor will be displayed. Using Direction buttons to move the cursor to desired window, and then press Play button to playback the recorded video. The password is needed before you playback the reocrded video.

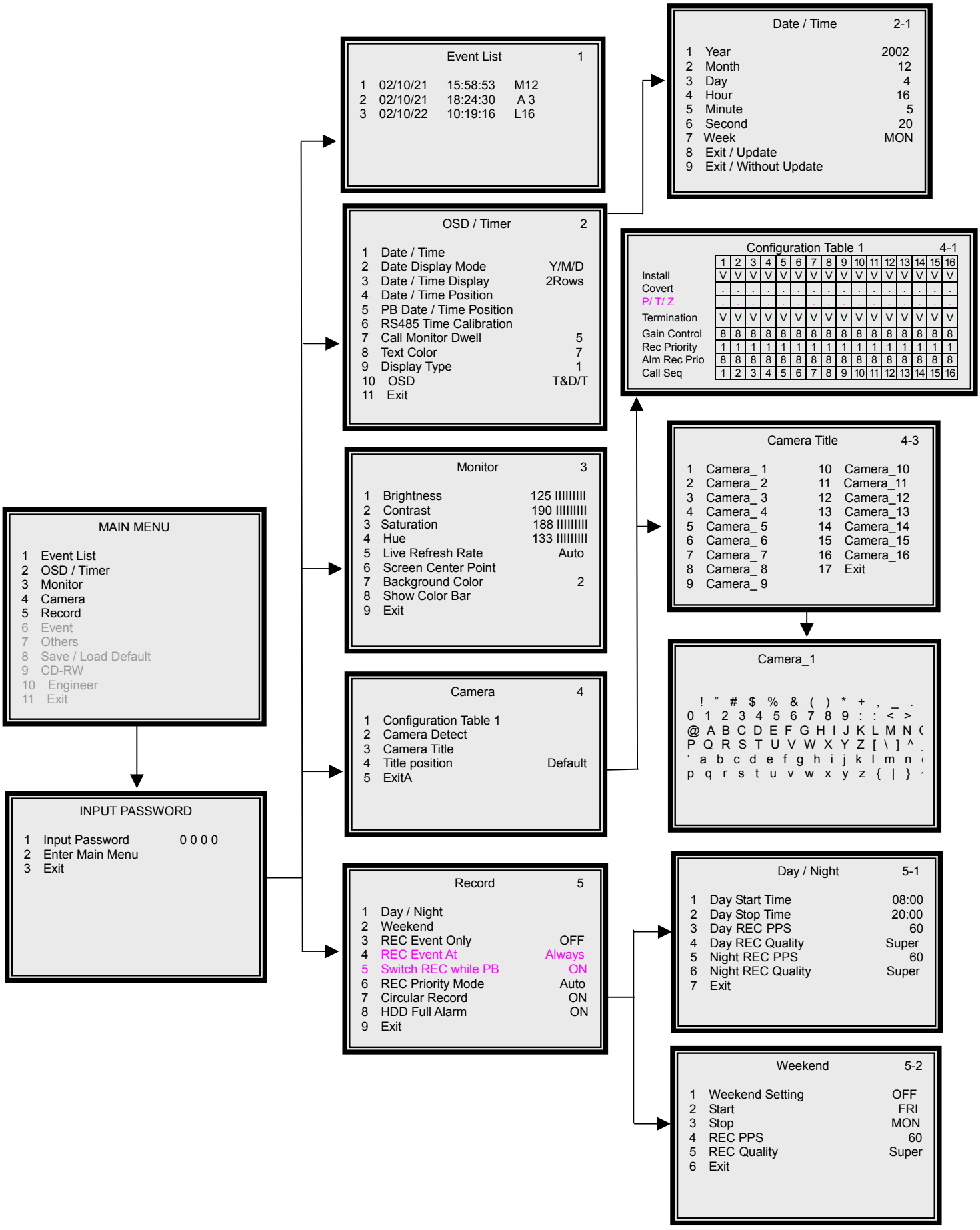
## 4.2 HDD and CD-RW

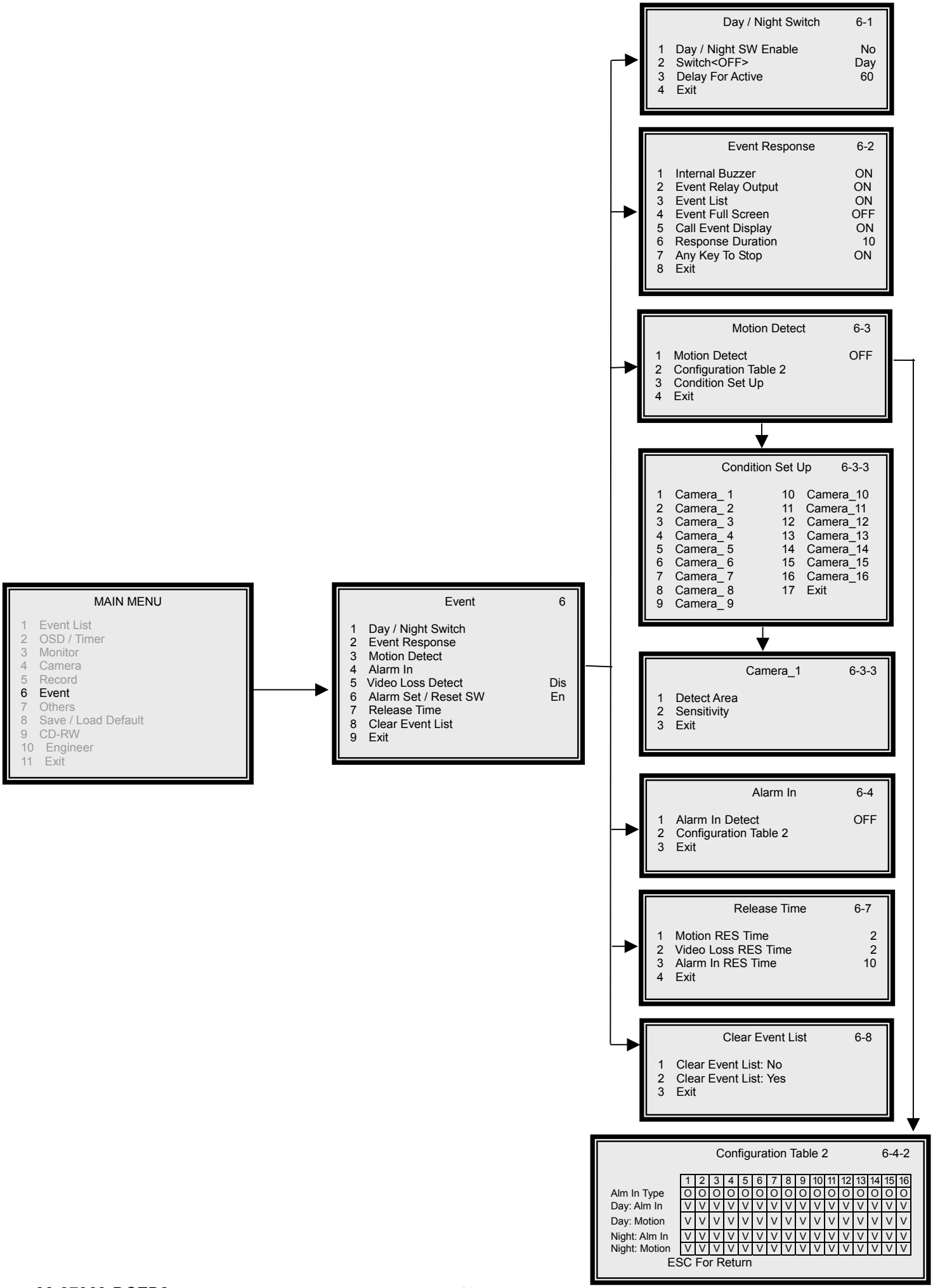
The front panel contents a swappable HDD and a CD-RW for video clip export.

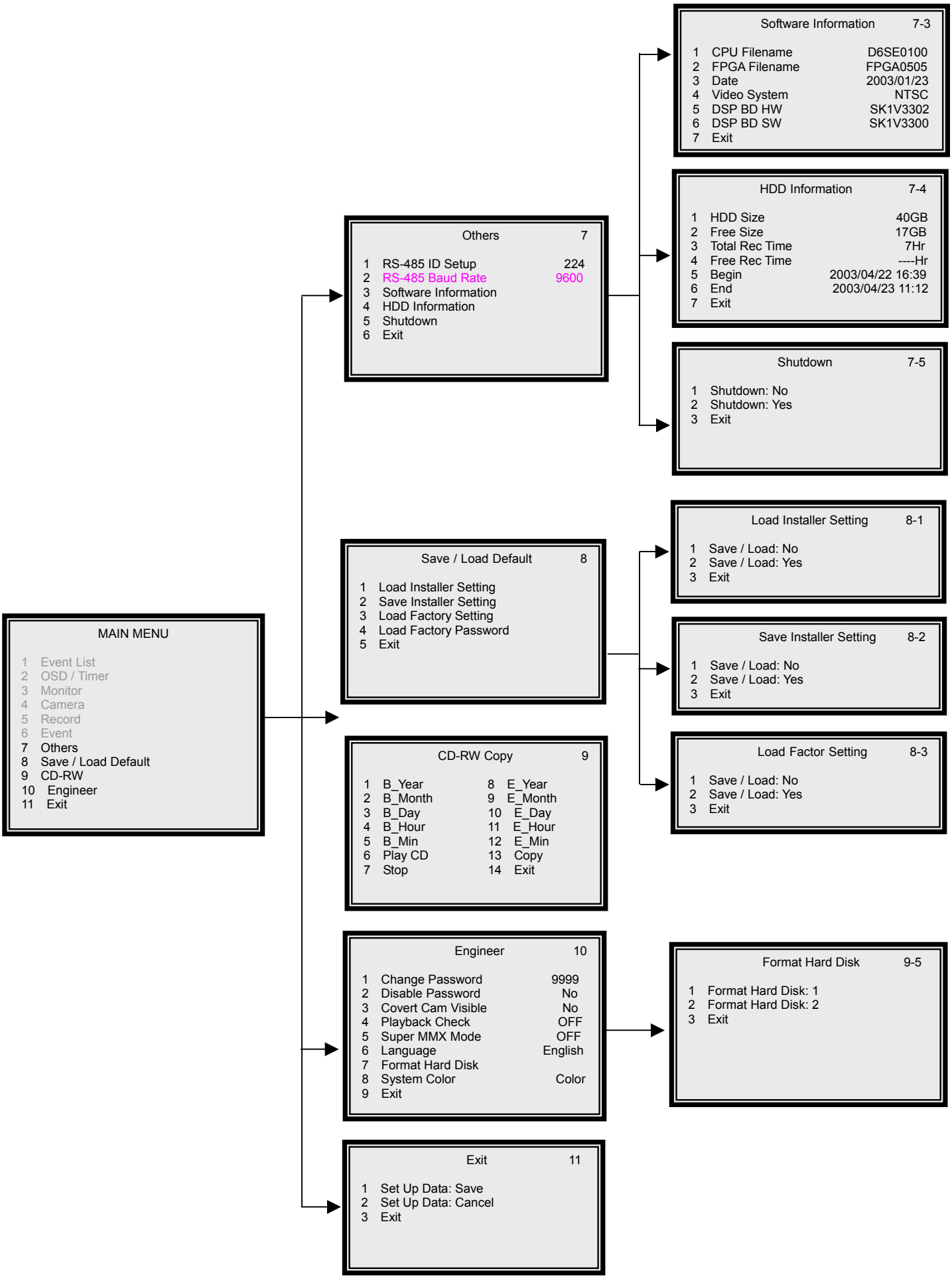
Swappable HDD

CD-RW

# 5. MUXDVR Menu Tree




MAIN MENU
1 Event List
2 OSD / Timer
3 Monitor
4 Camera
5 Record
6 Event
7 Others
8 Save / Load Default
9 CD-RW
10 Engineer
11 Exit
Event 6
1 Day / Night Switch
2 Event Response
3 Motion Detect
4 Alarm In
5 Video Loss Detect Dis
6 Alarm Set / Reset SW En
7 Release Time
8 Clear Event List
9 Exit
Day / Night Switch 6-1
1 Day / Night SW Enable No
2 Switch<OFF> Day
3 Delay For Active 60
4 Exit
Event Response 6-2
1 Internal Buzzer ON
2 Event Relay Output ON
3 Event List ON
4 Event Full Screen OFF
5 Call Event Display ON
6 Response Duration 10
7 Any Key To Stop ON
8 Exit
Motion Detect 6-3
1 Motion Detect OFF
2 Configuration Table 2
3 Condition Set Up
4 Exit
Condition Set Up 6-3-3
1 Camera_ 1
2 Camera_ 2
3 Camera_ 3
4 Camera_ 4
5 Camera_ 5
6 Camera_ 6
7 Camera_ 7
8 Camera_ 8
9 Camera_ 9
10 Camera_10
11 Camera_11
12 Camera_12
13 Camera_13
14 Camera_14
15 Camera_15
16 Camera_16
17 Exit
Camera_1 6-3-3
1 Detect Area
2 Sensitivity
3 Exit
Alarm In 6-4
1 Alarm In Detect OFF
2 Configuration Table 2
3 Exit
Release Time 6-7
1 Motion RES Time 2
2 Video Loss RES Time 2
3 Alarm In RES Time 10
4 Exit
Clear Event List 6-8
1 Clear Event List: No
2 Clear Event List: Yes
3 Exit
Configuration Table 2 6-4-2
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Alm In Type O O O O O O O O O O O O O O O O
Day: Alm In V V V V V V V V V V V V V V V V
Day: Motion V V V V V V V V V V V V V V V V
Night: Alm In V V V V V V V V V V V V V V V V
Night: Motion V V V V V V V V V V V V V V V V
ESC For Return

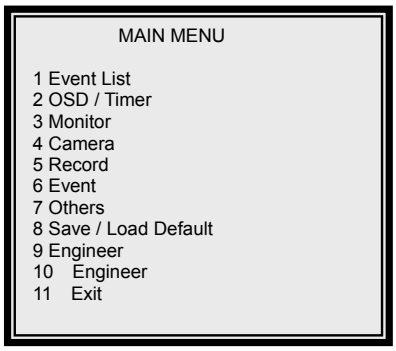

MAIN MENU
1 Event List
2 OSD / Timer
3 Monitor
4 Camera
5 Record
6 Event
7 Others
8 Save / Load Default
9 CD-RW
10 Engineer
11 Exit
Others 7
1 RS-485 ID Setup 224
2 RS-485 Baud Rate 9600
3 Software Information
4 HDD Information
5 Shutdown
6 Exit
Software Information 7-3
1 CPU Filename D6SE0100
2 FPGA Filename FPGA0505
3 Date 2003/01/23
4 Video System NTSC
5 DSP BD HW SK1V3302
6 DSP BD SW SK1V3300
7 Exit
HDD Information 7-4
1 HDD Size 40GB
2 Free Size 17GB
3 Total Rec Time 7Hr
4 Free Rec Time ----Hr
5 Begin 2003/04/22 16:39
6 End 2003/04/23 11:12
7 Exit
Shutdown 7-5
1 Shutdown: No
2 Shutdown: Yes
3 Exit
Save / Load Default 8
1 Load Installer Setting
2 Save Installer Setting
3 Load Factory Setting
4 Load Factory Password
5 Exit
Load Installer Setting 8-1
1 Save / Load: No
2 Save / Load: Yes
3 Exit
Save Installer Setting 8-2
1 Save / Load: No
2 Save / Load: Yes
3 Exit
Load Factor Setting 8-3
1 Save / Load: No
2 Save / Load: Yes
3 Exit
CD-RW Copy 9
1 B_Year
2 B_Month
3 B_Day
4 B_Hour
5 B_Min
6 Play CD
7 Stop
8 E_Year
9 E_Month
10 E_Day
11 E_Hour
12 E_Min
13 Copy
14 Exit
Engineer 10
1 Change Password 9999
2 Disable Password No
3 Covert Cam Visible No
4 Playback Check OFF
5 Super MMX Mode OFF
6 Language English
7 Format Hard Disk
8 System Color Color
9 Exit
Format Hard Disk 9-5
1 Format Hard Disk: 1
2 Format Hard Disk: 2
3 Exit
Exit 11
1 Set Up Data: Save
2 Set Up Data: Cancel
3 Exit

# 6. OSD Menu Setup

The OSD menu is composed in hierarchy architecture, it allows you to configure the MUXDVR according to the applictation enveironment. Many options can be selected via the operation of the OSD menu.

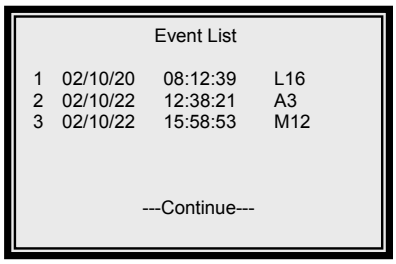
To enter this OSD menu, press the MENU button of the front panel, then the OSD menu will appear with a highlight cursor over the first item. The cursor can be moved by the up and down buttons.

If you want to exit the OSD menu, you may either 1)select the last item “EXIT” and then press ENTER button; or 2)press ESC button of the front panel directly.



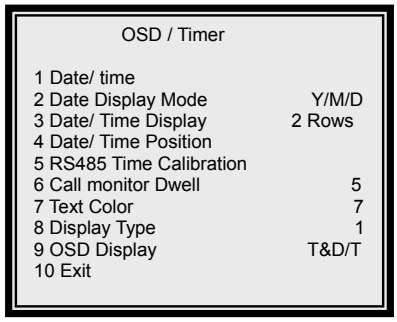

## 6.1 Event List

The item allows you to enter the Event List. Up to 255 events will be logged using non-volatile memory. The memory architectrue is “First In First Out”, so always the latest events remain on the list.




## 6.2 OSD/ Timer

This menu allows you to set the current date/ time, and other On-Screen-Display (OSD) parameters. You can press the ENTER button to enter the sub-menu.


OSD / Timer
1 Date/ time
2 Date Display Mode Y/M/D
3 Date/ Time Display 2 Rows
4 Date/ Time Position
5 RS485 Time Calibration
6 Call monitor Dwell 5
7 Text Color 7
8 Display Type 1
9 OSD Display T&D/T
10 Exit

### 6.2.1 Date/ Time

Item 1~7 allow you to set the date and time, use the right/ left buttons to adjust the MUXDVR to local time.

If you want to save the modification(s), move the cursor to 8 Exit/ Update and press Enter button, the adjusted setting(s) will be memorized. If you don’t want to save the modifications, move the cursor to 9 Exit / Without Update and press Enter button, the adjusted setting(s) will be discarded.

### 6.2.2 Date Display Mode

This item allows you to select a format of date OSD display. You can use right/ left buttons to choose the select from: Y/M/D, M/D/Y and D/M/Y.

### 6.2.3 Date/ Time Display

This item allows you to select one or two rows for Date /time OSD display.

### 6.2.4 Date/ Time Position

This item allows you to move current Date/ Time Display to any position. Use the DIRECTION buttons to move Date/ Time display.

### 6.2.5 PB Date/ Time Position

This item allows you to move the recorded Date/ Time Display to any position.

### 6.2.6 RS-485 Time Calibration

RS-485 is used for multi-point communications: many devices can be connected to the same bus. Move to this item and press the ETNER button, all MUXDVR timers will be synchronized.

### 6.2.7 Call Monitor Dwell

The call monitor is always switching full screen video of all installed cameras, this item allows you to set the Dwell Time between switching. The timer value ranges from 1 to 255 (the unit is second).

### 6.2.8 Text Color

This item allows you to select one from 16 different colors for all display on the screen.

### 6.2.9 Display Type

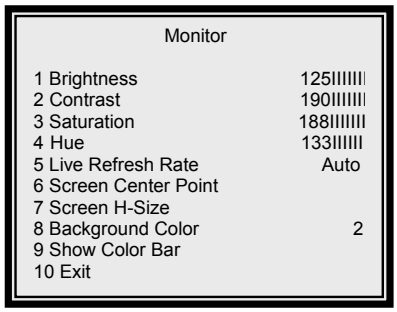
This item allows you to select one from 6 different text types (reverse, bold…) for on Date/ Time display.

### 6.2.10 OSD

This item allows you to select which information you want to display; you can choose from 1)T&D/T(camera title and date/time); 2)Title; 3)D/T(date/time); 4)OFF.

## 6.3.Monitor

This menu allows you to adjust the quality of the displayed image.




### 6.3.1 Video Setup

Item 1~4 involve adjusting the brightness, contrast, saturation and hue of attached cameras. You may use the right/ left DIRECTION buttons to adjust the value.

### 6.3.2 Live Refresch Rate

This item allows you to setup the camera refresh rate on the Main monitor; use right/ left buttons to select “Fix” or “Auto”. “Fix” means each camera has the same refresh rate. “Auto” means the camera with more motion will get higher refresh rate automatically.

## 6.3.3 Screen Center Point

This item allows you to move the center point of the main monitor. Use the DIRECTION buttons to pan/ tilt the monitor center point. Press ESC button to exit when finished.

## 6.3.4 Background Color

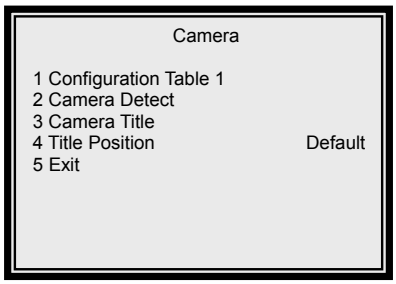
This item allows you to select 1 from 16 different colors for the background color of 1) video-loss, 2) camera un-installed and 3) covert situations.

## 6.3.5 Show Color Bar

This function allows you to fine tune the monitor's performance using color bar pattern generated by the MUXDVR.

# 6.4 Camera

This menu allows you to adjust camera-related items, ex. Camera title, Power On Detect, etc.




## 6.4.1 Configuration Table 1

Configuration Table 1 allows you to configure 5 parameters for each camera individually.

**Configuration Table 1**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Install | V | V | V | V | V | V | V | V | V | V | V | V | V | V | V | V |
| Covert | · | · | · | · | · | · | · | · | · | · | · | · | · | · | · | · |
| External | · | · | · | · | · | · | · | · | · | · | · | · | · | · | · | · |
| Termination | V | V | V | V | V | V | V | V | V | V | V | V | V | V | V | V |
| Gain Control | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| REC Priority | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Alm REC Prio | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| Call Seq | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |

ESC For Return

### Install

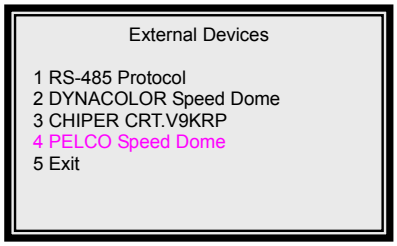
This item allows you to install each channel on 1 Configuration Table1. Every channel is "installed" by default; you may uninstall any one of them manually. Once a channel is un-installed, all related functions are disabled (√ = camera installed; • = camera not installed).

### Covert

This item allows you to make each camera's input invisible (covert) on both main and call monitor, while MUXDVR keeps recording the camera's video. The default setting is every camera visible (√ = covert; • = not covert).

## External

Set this item to enable, users can set the following external device OSD settings through the MUXDVR front panel. Press the number button corresponding to the wanted camera to make it full screen, and then press the SET button to go to the “External Devices” Menu.




### ◆ RS-485 Baud Rate

Baud rate is a number related to the speed of data transmission in your security system. The higher the baud rate, the more bits per second that are transferred. Before the data are transferred between two devices, you must ensure that both devices are configured to the same transmission rate.

### ◆ DSCP Speed Dome

This sub-menu is offered to adjust the dome settings. After you are in the sub-menu, you can pan/ tilt the speed dome freely by pressing SET and the direction buttons simultaneously.

#### ◇ RS-485 ID Setup

If you want to control the DSCP Speed Dome through the front panel, you should firstly check and modify the RS-485 ID here.

#### ◇ Zoom

Press the Enter button to enter the Zoom mode. You can simply push the right direction button to zoom in (tele) and the left direction button to zoom out (wide). Press the ESC button to exit the Zoom mode.

#### ◇ Brightness

Use the right and left direction buttons to adjust the brightness of the selected dome camera. Press the ESC button to exit.

#### ◇ Set Preset Point

This item allows you to set the preset points. Pan/ Tilt the dome camera to the wanted position and give the preset point a number, and then press the Enter button.

#### ◇ Enter Speed Dome Menu

Press Enter on this item to go to the OSD menu of installed Speed Dome.

### ◆ PELCO Speed Dome

Users are allowed to control and set the settings of the PELCO Speed Dome through the sub-menu.

#### ◇ Protocol Setup

#### ◇ ID Setup

#### ◇ Zoom

◇ **Focus**

◇ **Brightness**

◇ **Set Preset Point**

◇ **Goto Preset Point**

◇ **Enter Speed Dome Menu**

## ◆ CHIPER CRT.V9KRP

This sub-menu allows you to set the receiver. In the sub-menu, you can pan/ tile the receiver by pressing SET and direction buttons simultaneously.

◇ **Item 1~4 (ID Setup, Zoom, Focus, Brightness)**

Please refer to the receiver user's manual for detailed information.

◇ **Set Preset Point**

This item allows you to set preset points through the front panel. Pan/ tilt the connected receiver to a proper position, and then press the number buttons to assign a number to the preset point. Press Enter to finish the setting.

◇ **Goto Preset Point**

Press right/ left direction button to select the number of the wanted preset point; then press Enter to go to the selected preset point.

◇ **Set Group Dwell**

Press the right/ left direction button to choose a proper dwell time.

◇ **Go Preset Group**

Press Enter to start sequencing.

◇ **Stop Preset Group**

Press Enter to stop sequencing.

### Termination

This item allows you to enable/ disable the terminal resister of each camera. If the camera loop-back connector is not used, the terminal resister should be enabled to get correct signal termination; this is the default condition. Otherwise, the terminal resister should be disabled (√ = Terminal resister is enabled; • = Terminal resister is disabled).

### Gain Control

This item allows you to adjust the camera's video level. You may adjust the value between 1 and 16 for each camera.

### REC Priority

This item allows the user to set the recording priority for each camera under normal state (No alarm occurred). The MUXDVR will record the camera that is assigned with a higher priority more frequently.

The user can move the cursor and use ENTER key to adjust the value. The value ranges from 1 to 16; "1" stands for the lowest priority; "16" stands for the highest priority. If the camera is not installed, the priority will be set to 0 automatically.

### Alarm REC Priority

This item allows you to set the recording priority when an alarm is triggered for the current channel, either by Alarm In or by Motion.

### Call Seq

For Call monitor, there are 16 steps programmable. This item allows you to assign camera for each step (1~16); “0” means to skip this step. Those cameras which are not installed or converted won’t be displayed on call monitor.

Example:

If you set the PPS to “30”, the record priority of channel to level ”4”, and the record priority of all rest channels to level “1’, then each channel’s PPS can be count by below formula.

**Situation 1**: No alarm event happens.

$$\text{Channel 1 PPS} = 30 * \frac{4}{4+1+1+1+1+1+1+1+1+1+1+1+1+1+1+1} = 6.31$$

$$\text{Channel 2 PPS} = 30 * \frac{1}{4+1+1+1+1+1+1+1+1+1+1+1+1+1+1+1} = 1.58$$

$$\text{Channel 3 PPS} = 30 * \frac{1}{4+1+1+1+1+1+1+1+1+1+1+1+1+1+1+1} = 1.58$$

**Situation 2**: An alarm event happens on channel 2.

$$\text{Channel 1 PPS} = 30 * \frac{4}{4+8+1+1+1+1+1+1+1+1+1+1+1+1+1+1} = 4.61$$

$$\text{Channel 2 PPS} = 30 * \frac{8}{4+8+1+1+1+1+1+1+1+1+1+1+1+1+1+1} = 9.23$$

$$\text{Channel 3 PPS} = 30 * \frac{1}{4+8+1+1+1+1+1+1+1+1+1+1+1+1+1+1} = 1.15$$

## 6.4.2 Camera Detect

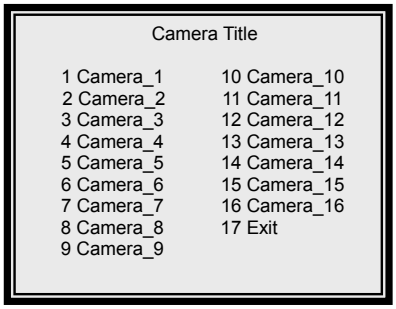
The MUXDVR can check the camera BNC connectors for video signal and judge the channel is connected or not. If the camera doesn’t exist, it’s recommended to set that channel as “not installed”. Otherwise that channel will be considered as “video loss”. Besides, the MUXDVR storage space is wasted.

Move the cursor to 2 Camera Detect and press the Enter button, the Configuration Table 1 will appear. The cameras which are not installed will have a dot symbol in the corresponding position.

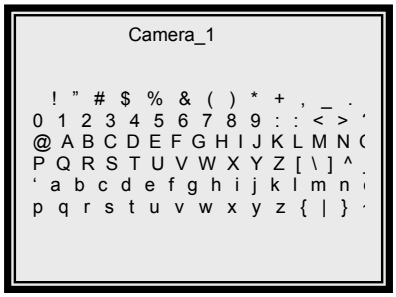
## 6.4.3 Camera Title

Each camera can be assigned a “Title” (up to 12 characters). The default title for each camera is the channel number.

Move the cursor to 3 Camera Title and press ENTER, the list of cameras will appear. Select one camera and press ENTER again, and then you will enter the setup menu (shown on next page).



You can use DIRECTION buttons to select wanted character, and press ENTER to add the character to the title. You can also press MODE button to correct the wrong character you enter by mistake. Press MODE button, and a cursor will appear over the title. Press MODE button repeatedly till the cursor over the character need to be changed; now you can pick another character to replace it by using the DIRECTION buttons. The first character (blank) is used as Space button.



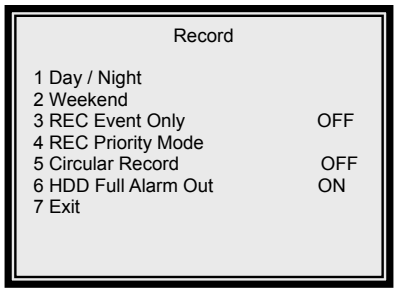

### 6.4.4 Title Position

This item allows you to choose the position of the OSD title.

## 6.5 Record

This menu allows you to set up all the parameters related to recording, ex. REC Quality, PPS (Picture Per Second)…

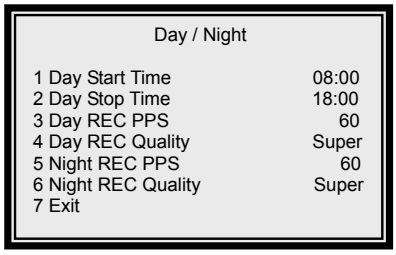
Once you change these parameters, the total record time will be changed as well. The table below is offered for your reference (the PPS is set to 60).




| HDD size | Total Record Time (Hour) | | | | |
|---|---|---|---|---|---|
| | Quality: Ultra | Quality: Super | Quality: High | Quality: Normal | Quality: Low |
| 40 GB | 5 | 7 | 9 | 12 | 15 |
| 80 GB | 10 | 14 | 18 | 24 | 30 |
| 120 GB | 15 | 21 | 27 | 36 | 45 |
| 160 GB | 20 | 28 | 36 | 48 | 60 |

### 6.5.1 Day/ Night

This menu allows you to setup the Day start/ stop time, the PPS (Picture Per Second) and recording quality for Day and Night time.


Day / Night
1 Day Start Time 08:00
2 Day Stop Time 18:00
3 Day REC PPS 60
4 Day REC Quality Super
5 Night REC PPS 60
6 Night REC Quality Super
7 Exit

#### Day Start Time/ Day Stop Time

These two items allow you to set the start/ stop time of the daytime. Use the DIRECTION buttons to enter the start/ stop time.

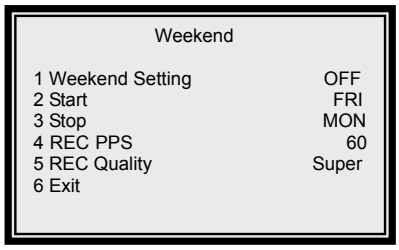
#### Day REC PPS/ Night REC PPS

These two items allow you to set the Day/ Night record PPS (Picture Per Second). The higher the number of pictures per second, the smoother the video playback appears to you, but it'll take more storage space.

#### Day REC Quality/ Night REC Quality

These two items allow you to set up the Day/ Night record quality. A superior picture quality affects a better playback, but will fill the hard disk faster; total record time will be shorter.

## 6.5.2 Weekend




This menu allows you to set up weekend start/ stop time, record PPS and record quality.

### Weekend Setting

This item allows you to enable/ disable the following weekend-related functions. If the item is set "OFF", all related functions will be disabled.

### Weekend Start Time/ Weekend Stop Time

These two items allow you to set up weekend start/ stop time.

### Weekend REC PPS

This item allows you to set weekend record PPS (Picture Per Second).

### Weekend REC Quality

This item allows you to set up the weekend record quality

## 6.5.3 REC Event Only

This item allows you to record event video (Alarm and Motion events) only. If you select "OFF" for this item, the MUXDVR remains in recording mode all the time. If you choose other options for this item, the MUXDVR will start recording only when an event is triggered; and the selected time period decides how long the MUXDVR stays in recording mode.

## 6.5.4 REC Event At

The MUXDVR allows you to record event recording only. In this case, you can decide the recording duration: Always, Night, Day and Weekend. If "Weekend" is selected (the "Weekend setting" must be "ON"), then the MUXDVR records event recording only on weekends; and if "always" is selected, the MUXDVR won't record image until an event is triggered all the time.

## 6.5.5 Switch REC While PB

If an event is triggered while you are playing back the video, the MUXDVR can switch back to recording image automatically to alert you to the event. If you choose "ON", the MUXDVR will switch back to the recording image while the event is triggered.

## 6.5.6 Rec Priority Mode

This item allows you to set up the record priority, use RIGHT/LEFT keys to select Setup or Auto. Setup means priority mode will follow the setup value in configuration table, Auto means the camera with most motion will get higher priority automatically.

## 6.5.7 Circular Record

The MUXDVR can store the recorded video information in circular or not. If the setting is “ON” (default), the earliest recorded video will be over-written automatically (none-stop recording).

If Circular Record setting is “OFF”, the recording will be stopped when the HDD is full; under this situation, a flash highlighted message (HDD Full) will be shown on the screen when the rest recording time is about 45 minutes; and the beeper will start beeping when the rest recording time is about 15 minutes.

## 6.5.8 HDD Full Alarm

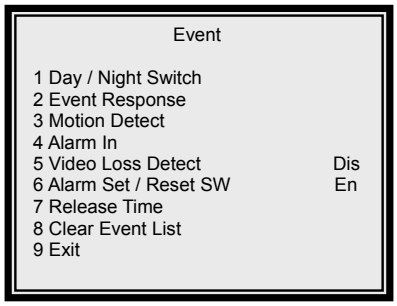
If you select “ON” for this item, the beeper will start beeping when the rest recording time is about 15 minutes; and the beeper will stop beeping after you insert a new HDD.

The other way to stop the beeper is to select “OFF” for this item.

# 6.6 Event

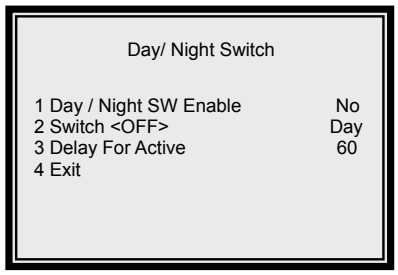
This menu allows you to configure how the EVENT condition is handled and how the MUXDVR responses.

When an alarm is triggered, you can press the ESC button and the alarm channel button to switch the call monitor to the alarm channel; after then, you can press these two buttons to start switching again.




## 6.6.1 Day/ Night Switch

This sub-menu allows you to enable or disable the “Day/ Night Switch” signal from the external I/O connector. Move to 1 Day/ Night Switch and press ENTER button, the sub-menu will appear.




### Day/ Night SW Enable

Use right/ left buttons to select YES (enable) or NO (disable). If you select “NO”, the Day/ Night Switch signal will be ignored; the event processor will follow the time schedule that defined in Record Section. If you select “YES”, the event processor will follow the On/ Off position of the external Day/ Night switch.

### Switch <OFF>

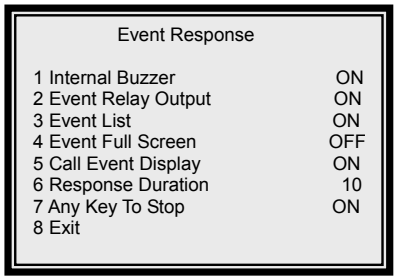
This item allows you to configure which setting (Day/ Night) will be activated when the switch is OFF. You may select Day or Night by using the right/ left buttons.

### Delay For Active

After the Day/ Night switch setting has changed, there is a delay time before the event process takes effect; this function is to avoid the operator triggering a false event by mistake.

## 6.6.2 Event Response

This sub-menu allows you to set how the MUXDVR responds to the triggered event.


Event Response
1 Internal Buzzer ON
2 Event Relay Output ON
3 Event List ON
4 Event Full Screen OFF
5 Call Event Display ON
6 Response Duration 10
7 Any Key To Stop ON
8 Exit

### Internal Buzzer

This item allows you to set the internal buzzer activated or not when an event is triggered.

### Event Relay Output

There are two alarm output signals in the external I/O connector: Alarm N.O. (normal open) and Alarm N.C. (normal close), these signals are driven by an on-board relay. These signals can be used to drive a light or siren to warn the operator of alarm events.

This item allows you to enable/ disable the alarm output pins. If the alarm output is OFF (disabled), the relay won't be energized when alarm is triggered.

### Event List

The events will be logged in the non-volatile memory.

The first column is the item number, followed by the date and time of the event and the "type of event": "A" represents Alarm Input, "L" represents Video Loss, and "M" represents Motion Detection. The last column is the channel number of the event.

### Event Full Screen

When event is occurred on any camera input, the video of this camera would be displayed on the main monitor in full screen, and keep until event duration time is expired. This item allows you to enable/ disable the function.

### Call Event Display

If you select "YES" for this item, The Call Monitor will switch to the corresponded camera immediately when an event is triggered. Otherwise, the Call Monitor just switches between each installed camera sequentially.

### Response Duration

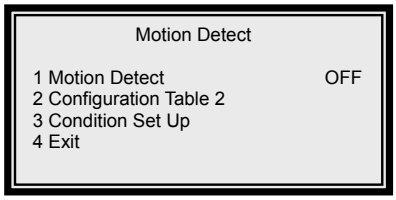
This item allows you to decide how long time the buzzer and Alarm Out relay keeps after an event is triggered. You can choose the alarm output from 1 second to 9999 seconds.

### Any Key To Stop

When the event is triggered, the buzzer will beep, the Alarm Out relay will be activated. If you want to stop these actions by pressing any one key, then you must select "YES" for this item.

## 6.6.3 Motion Detect

This menu allows you to configure how Motion Detection works. Each camera can have its “Detect Area” and “Sensitivity” defined individually.




### Motion Detect

This item allows you to enable/ disable the motion detect function of the MUXDVR.

### Configuration Table 2

Move the cursor to 2 Configuration Table 2 and press ENTER button, the table will appear.
This table allows you to enable/ disable the day and night motion detect functions.

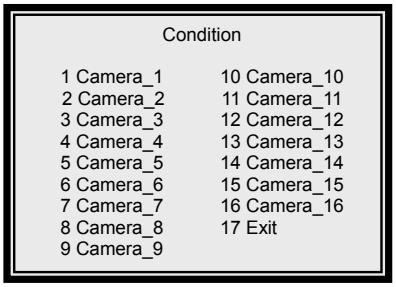
**Configuration Table 2**

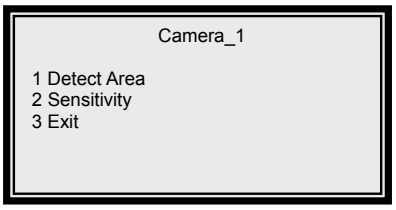
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alm In Type | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
| Day: Alm In | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Day: Motion | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Night: Alm In | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Night: Motion | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |

ESC For Return

### Condition Set Up

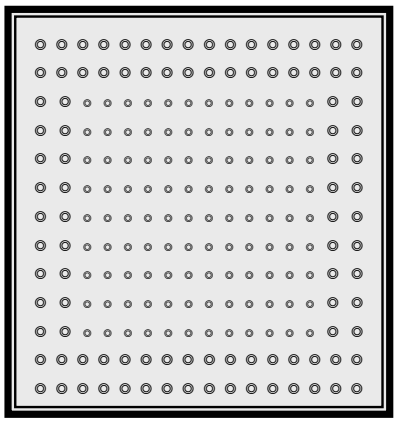
This menu allows you to setup each camera’s motion detected area and sensitivity.
You may select one camera from the list and press the ENTER button on it; then the following sub-menu will appear.



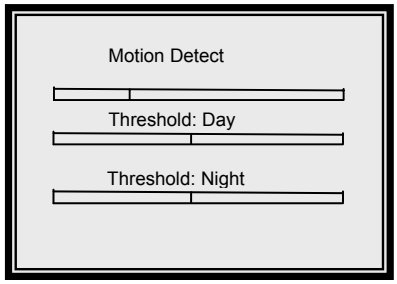




### Detect Area

This item allows you to setup the motion detect area of each camera.
The screen is covered by 192 (16x12) “detection grids”.
You may use the DIRECTION buttons to move the cursor then press the ENTER button to enable/ disable the grids. Pressing MODE button can change the size of the cursor. You may also toggle all the grids on/off by pressing SET button (◎: disabled; ◎ : enabled).

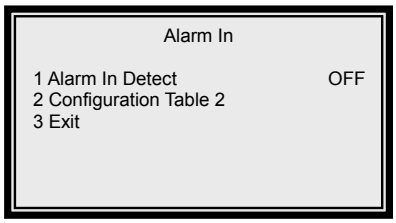


### Sensetivity




This item allows you to setup the threshold of motion detection.
The first bar shows the current detected amount of motion of this camera. The second and third bar allows you to setup the “day/ night threshold” (or “trigger level”), once the detected motion amount become larger than this level; the alarm will be triggered.

## 6.6.4 Alarm In




This menu allows you to enable/ disable the Alarm pins of external I/O connector and to select N.O. (normal open) or N.C. (normal close) type for each pin.

### Alarm In Detect

This item allows you to enable (YES) or disable (NO) the Alarm In pins.

### Configuration Table 2

This item allows you to select N.O. (normal open) or N.C. (normal close) type for each Alarm In pins.

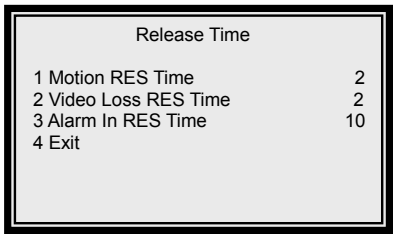
## 6.6.5 Video Loss Detect

This item allows you to enable/ disable the MUXDVR to detect Video Loss as an alarm event.

## 6.6.6 Alarm Set/ Reset SW

This item allows you to enable/ disable the Alarm Set/ Reset signal of the external connector. If you select EN (enable), then you can force the alarm output to on/ off by using Alarm Set signal.

## 6.6.7 Release Time



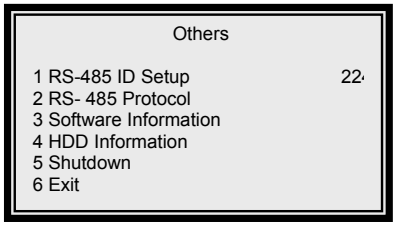

This menu allows you to set the “release time” of alarm source: motion detection, video loss and alarm in. The release time defines how long time after the alarm trigger condition disappears; the same condition should be ignored to avoid false alarm being re-triggered.

## 6.6.8 Clear Event List

This menu allows you to clear event list. If you want to delete the event list, move your cursor to 2 Clear Event List: YES. If you want to keep the event list, move your cursor to 1 Clear Event List: NO.
This arrangement is to avoid user clear the list by mistake.

## 6.7 Others

This menu allows you to check the RS485 communication protocol and software version.

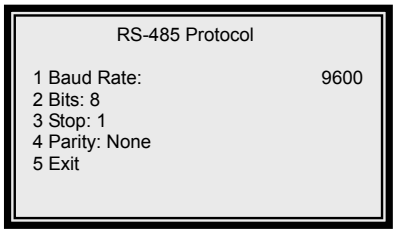



### 6.7.1 RS-485 ID Set Up

This item can only be accessed by the installer, the RS-485 ID address of this MUXDVR can be modified here.

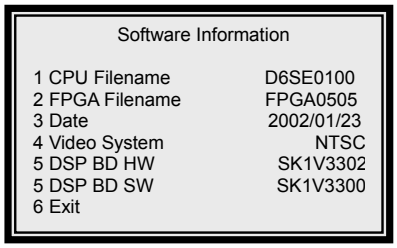
### 6.7.2 RS-485 Protocol

This menu shows the details of RS-485 protocol. The only setting user or installer can change here is “Baud Rate”. You can choose form 38400, 19200, 9600, 4800 and 2400.



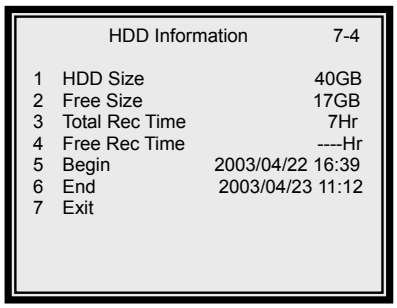

### 6.7.3 Software Information

This menu presents the software information.




### 6.7.4 HDD Information

This item shows you the HDD information.




**HDD Size** shows how large size the current HDD has for saving video files.

**Free Size** shows how much available space the current HDD leaves.

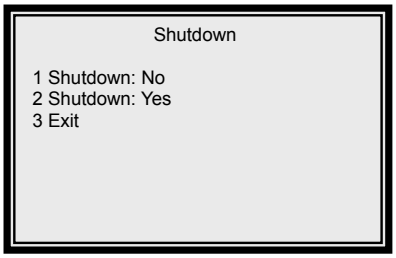
**Total Rec Time** shows how much time the current HDD originally can provide for saving the video files.

**Free Rec Time** shows how much time the current HDD can save video files. If the DVR is set to record in linear mode (the system will not overwrite files when the HDD is full), the available recording time will be calculated and shown on the screen automatically; or, if the DVR is set to circular mode, the OSD display on the screen will be “- - - - Hr”.

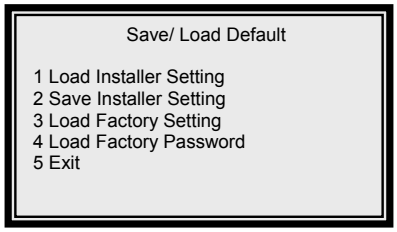
### 6.7.5 Shutdown

This item allows you to shutdown the MUXDVR.

There is the other way to shutdown the MUXDVR: press ESC and Down Arrow buttons simultaneously.

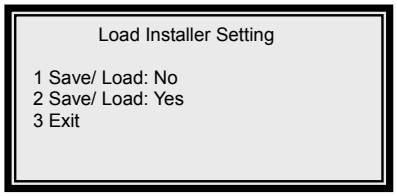


## 6.8 Save/ Load Default




This menu allows you to restore the MUXDVR to the default configuration, which was done by the installer (engineer), or the factory setting.

### Load Installer Setting




This item allows you to recall the “Installer’s Configuration” from the on-board non-volatile memory.

### Save Installer Setting

This item allows you to save the current setting as “Installer’s setting”. This operation can only be executed with engineer password; otherwise, “Illegal Operation” message will be displayed.

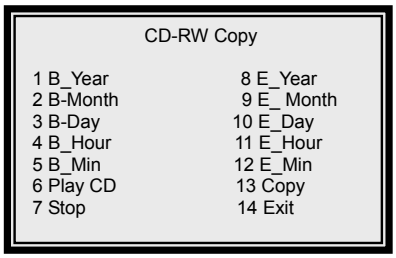
### Load Factory Setting

This item allows you to recall the “Factory’s Default” from the read only memory.

### Load Factory Password

This item allows you to reload the factory password in case you forget your own password.

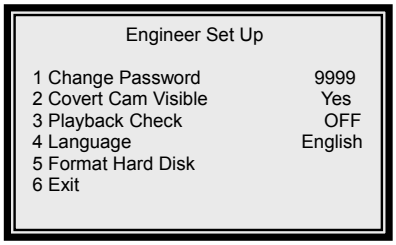
## 6.9 CD-RW Copy




This sub-menu allows you to export video to CD-RW. Select the start time and end time of desired video and then press ENTER on 13 Copy to start copying.

Press the 6th item to play the CD.

## 6.10 Engineer Set Up




If you enter the main menu with engineer’s password, you can enter this menu.

### 6.10.1 Change Password

This password can be changed to any four-digit number use right/ left buttons to change to a new number, press ESC button when finished, the password will be saved into non-volatile memory. If the user forgets this new password, he can recall the factory password by using Load Factory Password in Save Load Option sub-menu.

### 6.10.2 Disable Password

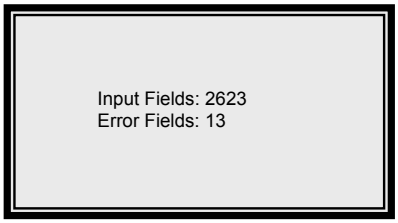
This item allows you to enter the OSD menu without entering the password. Therefore, you can save a lot of time while setting the DVR. This item will be restored to the default setting “No” automatically after you power off and on the DVR.

## 6.10.3 Covert Cam Visible

You can make some of the camera's video invisible (covert) on both main and call monitor, (but the recording is continued); if you want to view the covert video while the MUXDVR is playing back the recorded video, you should change this item to "YES".

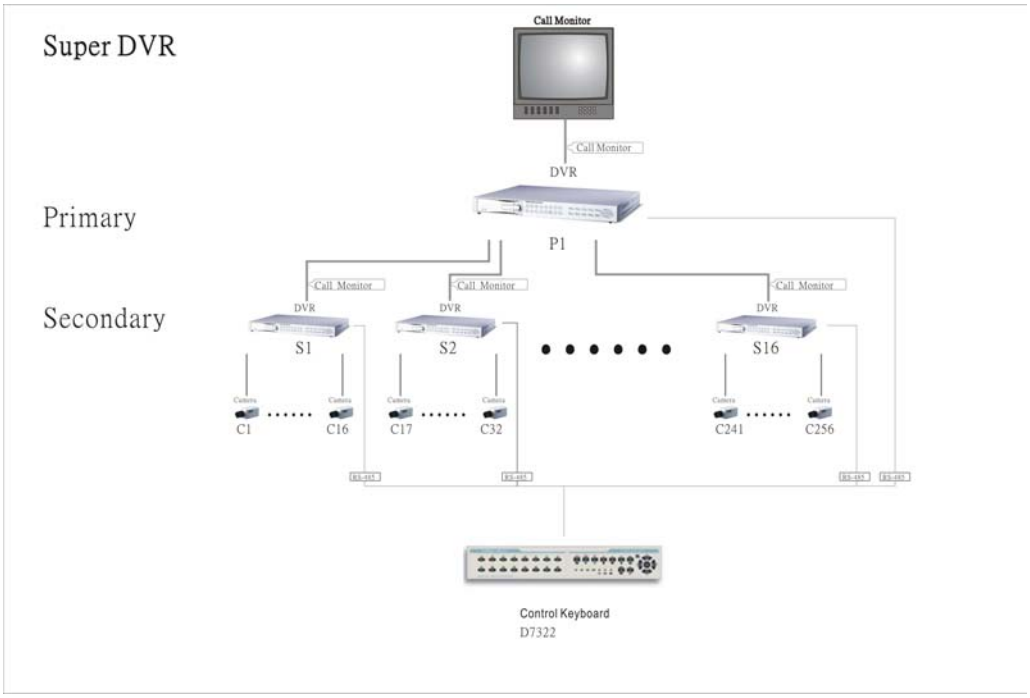
## 6.10.4 Playback Check

This item allows you to check the internal cabling of MUXDVR is functioning correctly or not, usually the "Error Fields" would be a very small number if the system functions correctly. If you choose "ON", the information will be displayed after you exit OSD menu mode.




## 6.10.5 Super MMX Mode

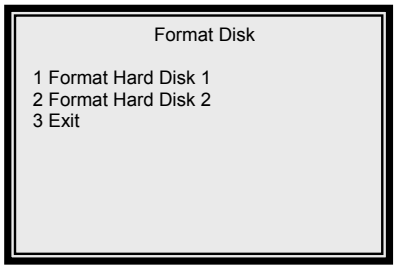
This function is used for Matrix-Multiplexer system. The system skeleton and setup guide is shown in Appendix 4 Super MMX and Super MPX System Setup. If you select "Yes", the call monitor display will depend on RS-485 command. The call monitor output of DVR 1~16 must be connected to the video input of DVR 17; you can monitor any camera of 256 cameras. Please also refer to control keyboard user manual. If you want to control MUXDVR by computer or other devices, please refer to Appendix 3. If you select 'OFF', the call monitor will work as defined in Configuration Table1 and EVENT setup.




## 6.10.6 Language

This item allows you to select your native language.

### 6.10.7 Format Hard Disk



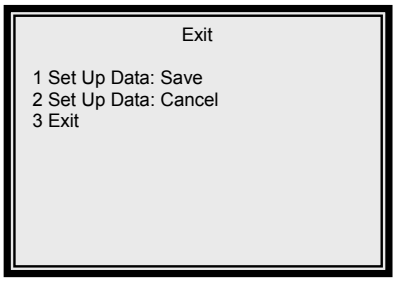

This item allows you to format the HDDs. Choose the HDD you want and then press ENTER to format the selected HDD.

Before you use a new HDD, you should insert it to MUXDVR to format to FAT32. And if the HDD was used in anther machine with another kind of file system, therefore, the HDD must be formatted to FAT32 in MUXDVR before recording process.

### 6.10.8 System Color

This item allows you to choose “Color” or “Mono”

## 6.11 Exit




If you move the cursor to first item and press ENTER, the modifications you have made will be saved into the non-volatile memory (EEPROM).

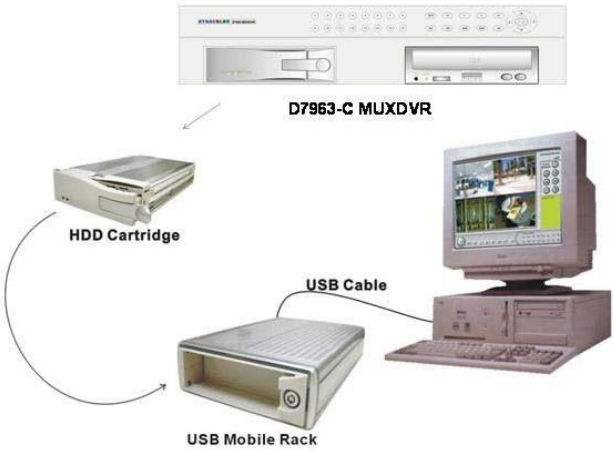
If you move the flashing highlight to the second item and press ENTER; or press ESC button on the front panel, the modification you have made will keep affective, but not saved into EEPROM. Therefore, if you power OFF and ON the MUXDVR, the modifications will be canceled.

# 7. Windows Application Software

The file format of MUXDVR is compatible with Windows O.S; you can process recorded video data under Windows 98, 2000 and XP systems. The application software allows you to playback, printout, export JPEG file or clip a segment of video.

## 7.1 Connect the USB Mobile Rack to PC

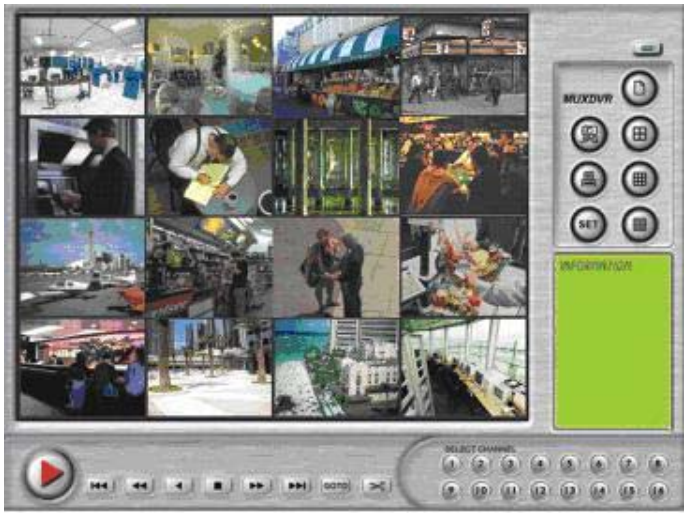
Move out the HDD Cartridge form MUXDVR and insert it to a “USB Mobile Rack”, then connect the “USB Mobile Rack” and PC with a USB Cable.



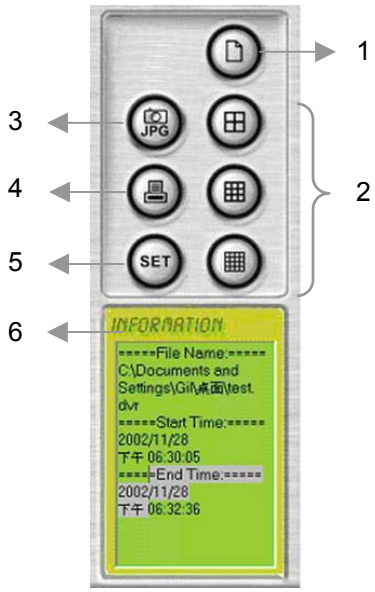
## 7.2 Download the Software

To process recorded video on your computer, you need to download DVR Windows application software first.

After Window AP has been installed, you can now connect the swappable HDD to your computer and process the recorded video.



## 7.3 Function Buttons




**1. Open File**

Press this button to search and open recorded video file.

**2. Display Mode**

Press these buttons to choose display mode (4, 9 and 16 windows).

**3. Save Image**

Press this button for saving current image (JPEG) on your P.C.

**4. Print Out**

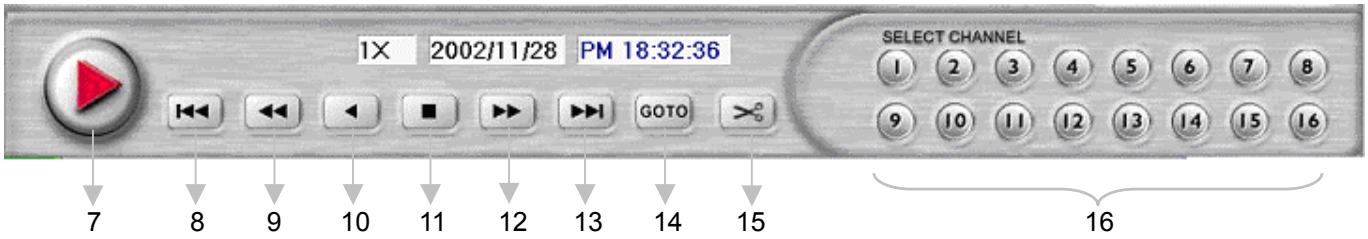
Press this button to print out single picture.

**5. Set**

Press this button to start setting windows. Use the Mouse to move the cursor to certain window, and then press a Channel button for assigning the camera to this window. The cursor will move to next window automatically.

**6. File Information**

The Information of the opened file will be shown here: File Name, Start Time and End Time.




**7. Playback**

Press this button to play the recorded video, and press it again to pause.

**8. Go to Begin**

Press this button to go to the first image of the recorded video.

**9. Fast Rewind**

Press this button to play the recorded video in reverse direction. Press this button repeatedly to change the playback speed: x1, x4, x8, x16, x32 and x64.

**10. Rewind Playing**

Press this button to rewind playing the recorded video at normal speed.

**11. Stop**

Press this button to stop playing the recorded video.

**12. Fast Forward**

Press this button to play the recorded video in forward direction. Press this button repeatedly to change the playback speed: x1, x4, x8, x16, x32, and x64.

**13. Go to End**

In playback mode, press this button to go to the end image of the opened file.

**14. GOTO**

In playback mode, press this button for searching the recorded video of certain date and time.

**15. Video Clipping**

Press this button to clip a small period of video for transferring more easily. Press “Video Clipping” to start clipping and Press again for stop.

**16. Channel 1~16**

Press one of these buttons to view the channel full screen.

# 8. MUXDVR Remote Access of Video over the Web

This section discusses the remote control ability of MUXDVR; it is an optional function. Users can access live and recoded video from remote site through Internet with Ethernet port connected. Key in the correct IP address, and then below control panel will appear on your computer screen.

Through the control panel, users can control and setup the settings of MUXDVR and connected speed dome remotely.

### 1. Zoom In/ Zoom Out

If the MUXDVR has connected to dome cameras, the two buttons are pressed for zooming in and out.

### 2. Iris Near/ Iris Far

These two buttons are used for controlling the iris lens. Proper adjustment will ensure the correct exposure depending on the camera's situation and the lighting levels.

### 3. Direction buttons

a. If the "Pan/ Tilt" (check box) is enabled (default), these buttons can be used to pan/ tilt the connected dome cameras. Choose a wanted camera through "P/ T/ Z ID" before you tried to pan/ tilt it.

b. If the "Pan/ Tilt" (check box) is disabled, these buttons can be used to select OSD menu items of speed dome camera.

### 4. Menu/ Enter

In normal status, press this button to enter the OSD menu of connected speed dome camera. This button is used as “Enter” button while in speed dome OSD menu mode.

### 5. Step Degree

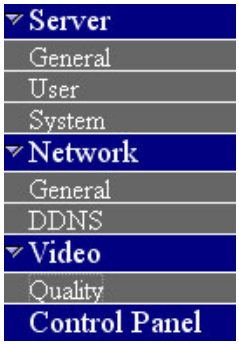
Users can set the step degree of dome camera. You can choose form 1~15 degree.

### 6. MUXDVR-related buttons

Please refer to page 6 for the descriptions of these button functions. The password is required before entering the MUXDVR menu through Internet.

### 7. Sever

Press this button to go to the sever-related menu (Figure 1). Users can modify the sever settings in this menu.



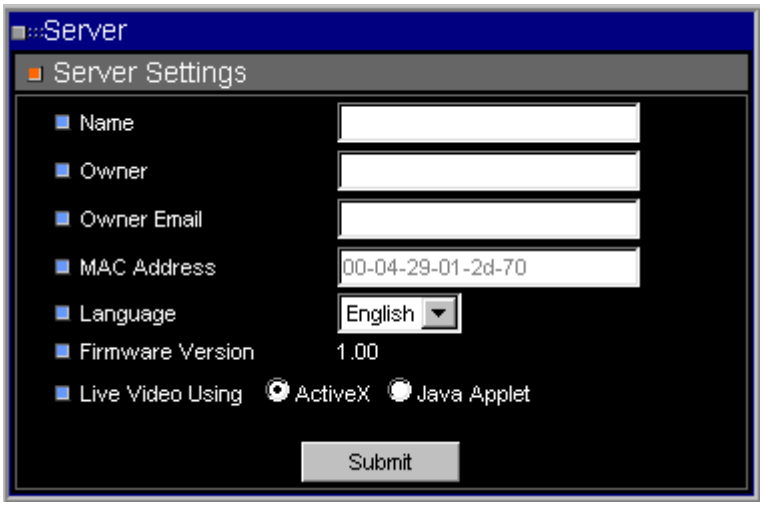

**<Figure 1>**

#### ◆ Server

You can set the server settings in this menu.

#### ◇ General

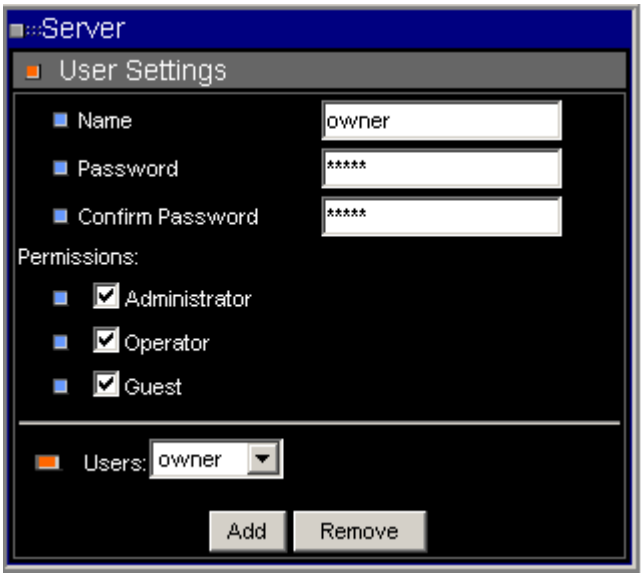
Users can set the general server settings here in this sub-menu (Figure 2). The MAC address will be detected and shown on the test box automatically.




**<Figure 2>**

### ◇ User

This sub-menu allows you to set the authorized user's name, individual password and the permission level (Figure 3).




**<Figure 3>**

### ◇ System

Choose "Save Changes" to save the modifications you've made (Figure 4).

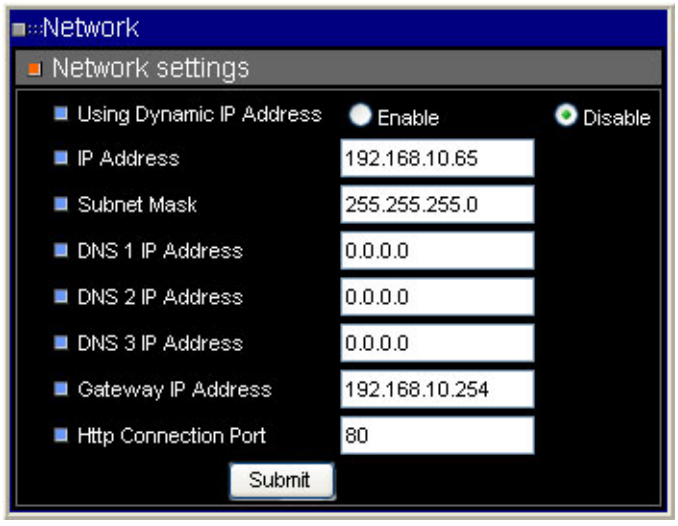
**<Figure 4>**

## ◆ Network

This sub-menu is offered to set network settings.

### ◇ Network settings

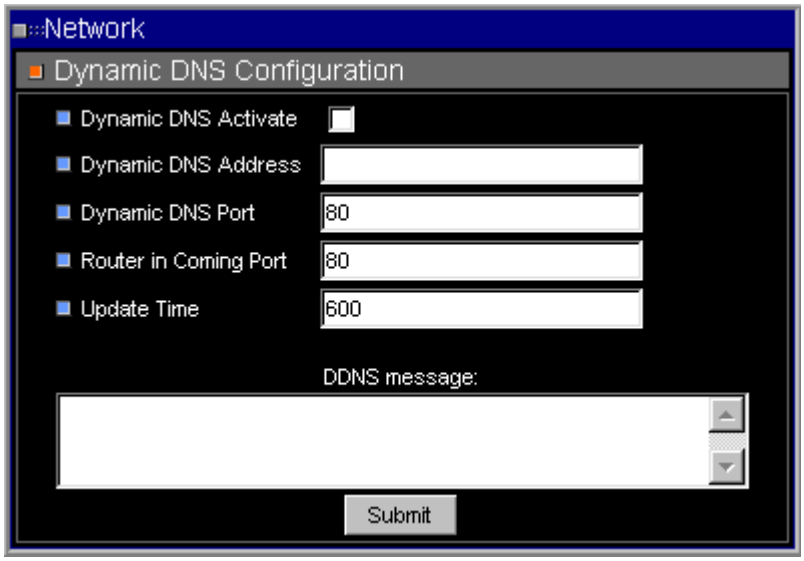
You can set the network-related setting here (Figure 5), including IP address, subnet mask…




**<Figure 5>**

## ◇ Dynamic DNS Configuration

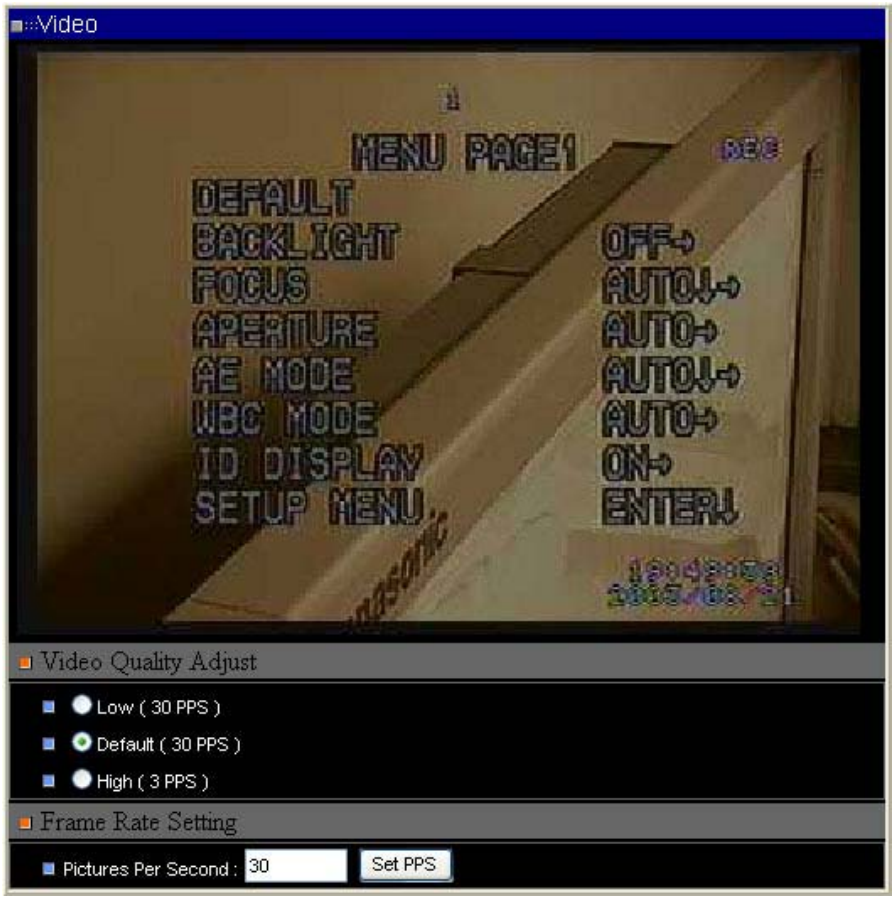
This sub-menu allows you to set the DDNS settings (Figure 6).




**<Figure 6>**

## ◆ Video

This sub-menu allows you to set the video quality and PPS (Picture Per Second) (Figure7).




**<Figure 7>**

### 8. GET ID

Press this button to show the MUXDVR ID on the screen.

### 9. DVR Password

Each password contains 4 characters. If you want to enter MUXDVR menu or enter playback mode, you have to enter correct password. You need to key the password in the field then press “send” button before you enter MUXDVR menu or playback mode. The password shown on screen will not change but you are already able to enter MUXDVR main menu to change settings or to enter playback mode.

### 10. Channel Buttons

The number of channel buttons corresponds to the number of channels supported by the unit. Press one of these buttons to view the channel full screen.

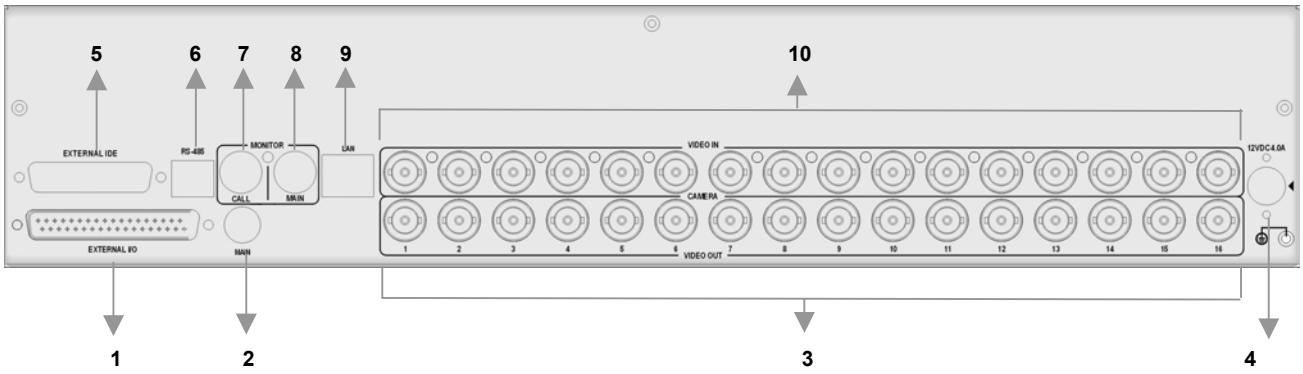
**Note: If you want to select MUXDVR menu item, you don’t have to do it by directional key. You can use Channel Buttons instead. For example, if you want to select MUXDVR menu item 3 Monitor, you can just press Channel Button “3” on the right side.**

### 11. MUXDVR ID

Users can set the MUXDVR ID here.

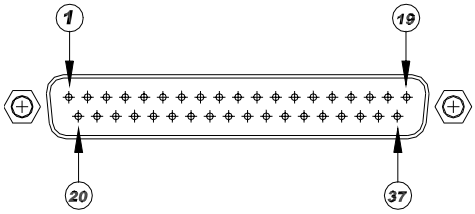
# 9. Connectors

## Rear Board




| Item | Description |
|---|---|
| 1 | External I/O |
| 2 | Main Monitor output (S-Video) |
| 3 | Video Looping (1~16) |
| 4 | Power Jack |
| 5 | IDE Port |
| 6 | RS-485 Port |
| 7 | Call Monitor Output (BNC) |
| 8 | Main Monitor Output (BNC) |
| 9 | LAN Port |
| 10 | Video Input (1~16) |

## External I/O Port (37pin DSUB)



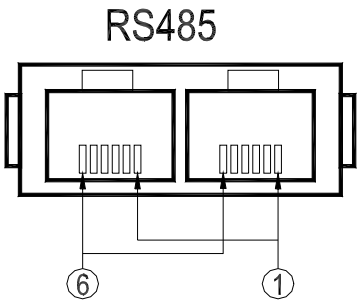

| Pin No. | Definition | Direction | Pin No. | Definition | Direction |
|---|---|---|---|---|---|
| 1 | GND | Power | 20 | Reserved | Input |
| 2 | GND | Power | 21 | Reset Alarm | Input |
| 3 | GND | Power | 22 | Day / Night output | Output |
| 4 | GND | Power | 23 | Day / Night switch | Input |
| 5 | Reserved | - | 24 | Set Alarm | Input |
| 6 | Reserved | - | 25 | Reserved | - |
| 7 | Alarm NO | Output | 26 | Alarm In 13 | Input |
| 8 | Alarm COM | Output | 27 | Alarm In 12 | Input |
| 9 | Alarm NC | Output | 28 | Alarm In 11 | Input |
| 10 | GND | Power | 29 | Alarm In 10 | Input |
| 11 | GND | Power | 30 | Alarm In 9 | Input |
| 12 | GND | Power | 31 | Alarm In 8 | Input |
| 13 | GND | Power | 32 | Alarm In 7 | Input |
| 14 | GND | Power | 33 | Alarm In 6 | Input |
| 15 | GND | Power | 34 | Alarm In 5 | Input |
| 16 | Alarm In 16 | Input | 35 | Alarm In 4 | Input |
| 17 | Alarm In 15 | Input | 36 | Alarm In 3 | Input |
| 18 | Alarm In 14 | Input | 37 | Alarm In 2 | Input |
| 19 | Alarm In 1 | Input | | | |

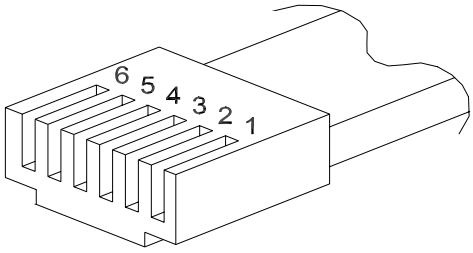
## External I/O Board

There is an “External I/O board” included in the MUXDVR box. You can connect it to the External I/O port; the pins are identified as the definitions listed on the board. Three pins are listed but of no use: VCR Trigger, RS-232 RX and RS-232 TX.

## RS-485 (RJ11)

The default RS-485 port connector is RJ11 6P6C connector.




RJ11 Cable 6P6C pin definition:

| Pin No. | Definition | Direction |
|---|---|---|
| 1 | - | - |
| 2 | - | Reserved |
| 3 | GND | Ground |
| 4 | DA (D +) | I/O |
| 5 | DB (D −) | I/O |
| 6 | - | - |

# 10. Specification

| | | |
|---|---|---|
| Model Name | MUXDVR | |
| Compression Method | Wavelet | |
| Video System | NTSC | PAL |
| Resolution-Live Video | 720 x 480 pixels | 720 x 576 pixels |
| Resolution-Recorded | 720 x 240 pixels | 720 x 288 pixels |
| Recording Rate | Up to 60 PPS | Up to 50 PPS |
| Recording Device | Hot swappable HDD | |
| Video Export | CD-RW | |
| Recording Quality | Supper / High / Normal / Low | |
| Video Input | BNC x 16, 1.0 Vp-p, 75 ohm. | |
| Video Looping Through | BNC x 16, 1.0 Vp-p, 75 ohm. | |
| Main Monitor Output | BNC x 1, S-VHS x 1, 1.0 Vp-p, 75 ohm. | |
| Call Monitor Output | BNC x 1, 1.0 Vp-p, 75 ohm. | |
| Alarm Input | x 16, DSUB 37 pin male (TTL level) | |
| Alarm Output | x 1, DSUB 37 pin male, 2.0 A / 24 V | |
| Remote Control | RS-485 DSCP | |
| Playback Speed | Fast Forward / Rewind (x1~x8), picture by picture | |
| Zoom | Yes | |
| Power Supply | DC 12 V / 4 A | |
| Title | 12 characters | |
| Alarm List | Up to 255 events | |
| Dimensions | 432 x 44 x 400mm (W x H x D) | |
| Operating Temperature | 0~40°C | |

# Appendix 1: Hard Disk Error Message

Some messages will be shown on the screen when the H.D.D. cannot operate.

◆ **Message:** HDD Detect Time Out

**Symptom**: The system checks H.D.D. but gets no response over 30 seconds

**Possible reason**: H.D.D. power on failure

**Countermeasure**: 1). Wait for the DVR resets the H.D.D. automatically; 2). Power off and on again

◆ **Message:** No Hard Disk

**Symptom:** No HDD has been found by the system.

**Possible reason**: 1). No H.D.D; 2). H.D.D. detects failure

**Countermeasure**: 1). Insert a formatted (FAT 32) H.D.D; 2). Check the power/ IDE bus connectors, ensure they have been connected well; and then insert the H.D.D. again.

◆ **Message:** Check HDD Bus

**Symptom**: IDE bus error or H.D.D. Master/ Slave jumper error.

**Possible reason**: 1).The cable of IDE connectors may be damaged; 2). H.D.D. jumper may not be set to “Master”.

**Countermeasure**: 1). Check the cable of IDE connectors; it may be damaged; 2). Check the H.D.D. cable; ensure it has been connected with the cartridge well; 3). Check H.D.D. jumper; the jumper has to be set to “Master”.

◆ **Message:** Unknown HDD

**Symptom**: 1). The H.D.D. format is not acceptable.
2). The file system is not acceptable.

**Possible reason**: 1). The H.D.D. had been formatted with “NTFS” file system; 2). The H.D.D. had been partitioned or the HDD had not been formatted with “FAT32” file system.

**Countermeasure**: Enter OSD menu and format the H.D.D. again.

◆ **Message:** HDD Detect Fail

**Symptom**: The HDD is unusable.

**Possible reason**: Other unknown reasons.

**Countermeasure**: Exchange the H.D.D. for a new one.

# Appendix 2: Supported HDD

The supported HDDs are listed as below:

| Brand | Capacity | Rotation Speed | Part Number |
|---|---|---|---|
| Maxtor | 40GB | 5400 RPM | 4D040k2 |
| Maxtor | 80GB | 5400 RPM | 4D080H4 |
| Maxtor | 80GB | 7200 RPM | D740X-6L |
| Maxtor | 120GB | 5400 RPM | 4G120J6 |
| Maxtor | 160GB | 5400 RPM | 4G160J8 |
| Maxtor | 200GB | 5400 RPM | 4G200J8 |
| SAMSUNG | 40GB | 5400RPM | SV4002H |
| Seagate | 40GB | 7200RPM | ST340021A |
| Seagate | 60GB | 7200RPM | ST360021A |
| IBM | 61.5GB | 7200RPM | IC35L060AV |
| IBM | 76.8GB | 7200RPM | DTLA30707S |
| IBM | 82.3GB | 7200RPM | IC35L080AV |
| IBM | 123.5GB | 7200RPM | IC35L120AV |
| IBM | 185GB | 7200RPM | IC35L180AV |
| Western Digital | 80GB | 7200RPM | WD800JB |
| Western Digital | 40GB | 5400RPM | WD400EB |
| Western Digital | 60GB | 5400RPM | WD600AB |
| Western Digital | 80GB | 5400RPM | WD800AB |
| Western Digital | 120GB | 5400RPM | WD1200AB |
| Western Digital | 200GB | 7200RPM | WD2000JB |

Notice :

MUXDVR cannot support Seagate 80GB HDD (P/N 9T6006-003 firmware 3.19).

# Appendix 3: RS-485 Command Set

The texts of Data 0, 1 is in **ASCII** code format (**Normal Command**)

| Command | | OP_code | Data 0,1 | Note |
|---|---|---|---|---|
| Channel select | | A0H | “01” ~ ”0G” | Channel 1~16 |
| Screen mode select | Right | | “MR” | Detail setting must reference User’s manual |
| | Left | | “ML” | |
| Sequence | | | “S1” ~ ”S3” | Sequence 1~3 |
| Up key | | | “DU” | |
| Down key | | | “DD” | |
| Left key | | | “DL” | |
| Right key | | | “DR” | |
| Zoom/Enter | | | “DZ” | |
| Play key | | | “KV” | |
| Freeze/Pause | | | “KA” | |
| Set | | | “KS” | |
| ESC | | | “KE” | |
| List | | | “KL” | |
| Date/Time | | | “SD” | |
| Title | | | “ST” | |
| Menu | | | “SP” | |
| Key Lock | | | “SK” | Lock/ Un_Locked |
| Goto | | | “SR” | |
| Fast Rewind | | | “RW” | x1,x2,x4,x8 |
| Fast Forward | | | “FF” | x1,x2,x4,x8 |
| Universal End | | | “UE” | |
| Goto Time1 | | BDH | Data1, Data0 | Year & Month |
| Goto Time2 | | BEH | Data1, Data0 | Day & Hour |
| Goto Time3 | | BFH | Data1, Data0 | Minute & “G” |

PS: Goto Time1: Year=00~99 (it means 2000~2099); Month=01~12

Goto Time2: Day=01~31; Hour=00~23

Goto Time3: Minute=00~59; “G” ASCII=47H

Example:

If the Keyboard ID is 00H, the MUXDVR ID is E0H.

If you want to select camera 0 on the main monitor, you can use ‘**01**’ command.

(The ASCII Code of ‘01’ is **30H** & **31H**.)

| Byte 1 | Byte 2 | Byte 3 | Byte 4 | Byte 5 | Byte 6 |
|---|---|---|---|---|---|
| Receiver ID | Transmitter ID | OP Code | Data0 | Data1 | Checksum |
| E0H | 00H | A0H | 30H | 31H | 41H |

NOTE:

1. The time interval between byte and byte must be shorter than 2ms, and the time interval between 2 commands (6 bytes/command) must be longer than 2ms.
2. Checksum = Byte1 .xor. Byte2 .xor. Byte3 .xor. Byte4 .xor. Byte5

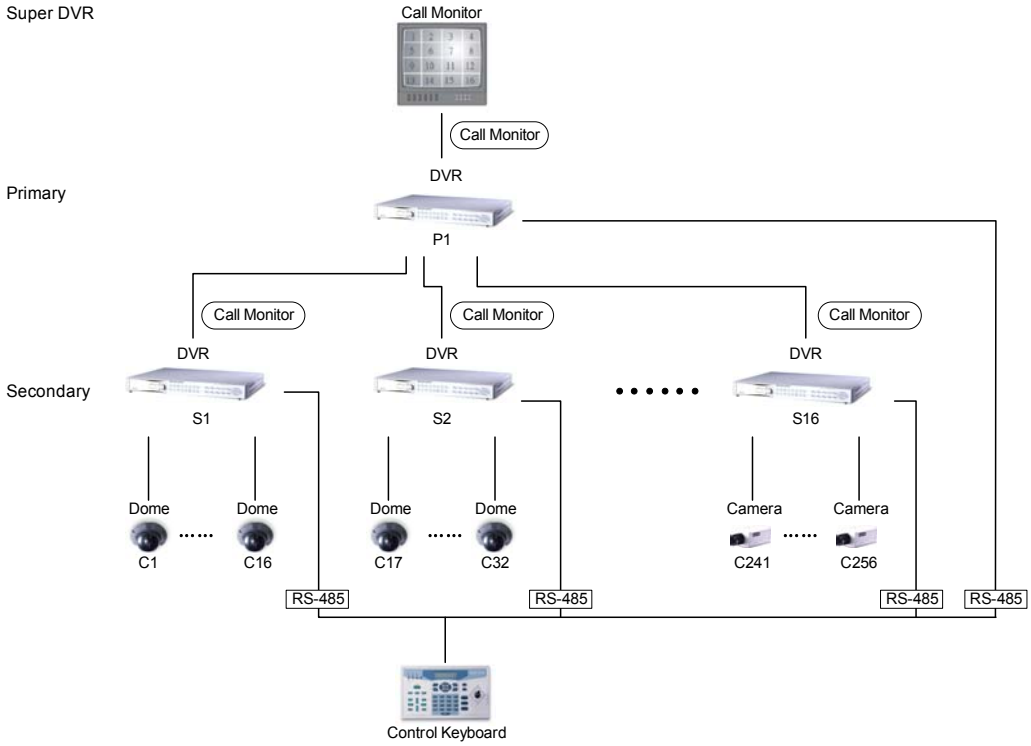
# Appendix 4: Super MMX and Super MPX System Setup

## 1. MMX (Multiplexer-Matrix)

Purpose: by using the call monitor output of the MUXDVR/multiplexer array to mimic (or emulate) a small matrix system, each one of the camera can be selected to be displayed on the system monitor.

Ex: when users want to view camera 32, in keyboard's speed dome mode, press camera number 32, then Enter, the system monitor will show the video from camera 32. If camera 32 happens to be a dome camera, he may use the joystick to control it immediately.

System diagram:




Notice:

(1) All MUXDVRs shown in the diagram can be Triplex Multiplexer.

(2) All MUXDVRs / multiplexers must enable Super MMX (in OSD menu)

(3) Choose "Super MMX" from "System Monitor Setting" in keyboard's "System Setting"

(4) All devices must be connected to the same RS485 bus. In security system, the Dome Cameras are mapping to each channel of the MUXDVR / multiplexer. For example, Dome 1 is mapped to channel 1 of S1 (MPX 1). Dome 24 is mapped to channel 8 of S2 (MPX 2)… and so on. When using keyboard as a system controller, please set up each device's ID according to the following table:

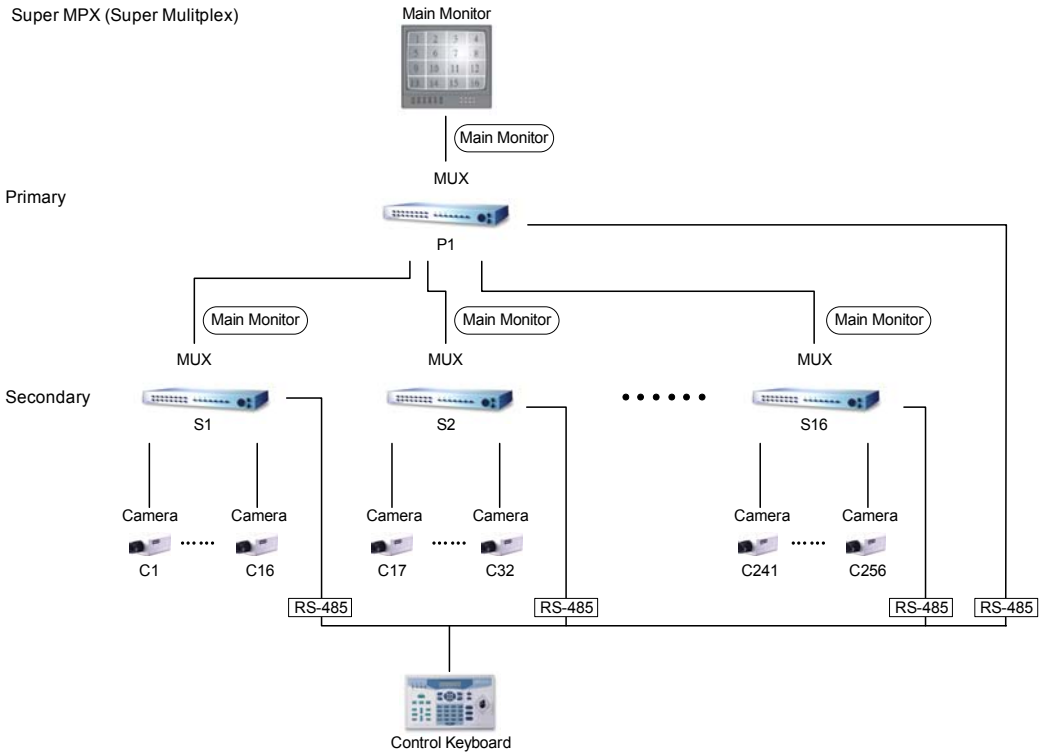
(5) The ID of MUXDVR / multiplexer P1 is 255.

| MPX NO | MPX ID | Camera ID | Remark |
|---|---|---|---|
| 1 | E0H, 224 | 01H – 10H, 1~16 | Channel 1~16 of MPX #1 |
| 2 | E1H, 225 | 11H – 20H, 17~32 | |
| 3 | E2H, 226 | 21H – 30H, 33~48 | |
| 4 | E3H, 227 | 31H – 40H, 49~64 | |
| 5 | E4H, 228 | 41H – 50H, 65~80 | |
| 6 | E5H, 229 | 51H – 60H, 81~96 | |
| 7 | E6H, 230 | 61H – 70H, 97~112 | |
| 8 | E7H, 231 | 71H – 80H, 113~128 | |
| 9 | E8H, 232 | 81H – 90H, 129~144 | |
| 10 | E9H, 233 | 91H – A0H, 145~160 | |
| 11 | EAH, 234 | A1H – B0H, 161~176 | |
| 12 | EBH, 235 | B1H – C0H, 177~192 | |
| 13 | ECH, 236 | C1H – D0H, 193~208 | |
| 14 | EDH, 237 | D0H – DFH, 209~223 | Only 15 Dome can be connect |
| 15 | EEH, 238 | None | Can connect to normal camera |
| 16 | EFH, 239 | None | Can connect to normal camera |

## 2. Super MPX (Super Multiplexer Mode)

Purpose: use Main Monitor instead of Call Monitor, the feature of selecting particular camera to the system monitor is the same as MMX mode. Besides of this, by setting the multiplexers correctly, all of the cameras in this system can be displayed on the system monitor sequentially. Ex: set the P1 multiplexer to Full Screen Sequence mode, dwell time = 3 seconds. Set S1 to S16 multiplexer to 4x4 display mode. Then in 48 seconds, all 256 cameras will be displayed on the system monitor sequentially.

System Diagram:



Notice:

(1) All Multiplexers shown in the diagram can be MUXDVRs.

(2) Choose “Super MPX” from “System Monitor Setting” in keyboard’s “System Setting”

(3) All the device must be connected to the same RS485 bus, the RS485 ID for each device must be set up as indicated in the above table.